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A BIOGRAPHY OF GEORGE HUNTINGTON, M.D.

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It has been said that all human achievement in art, science, or trade is the result of slow growth and development. Also some say that "genius is an infinite capacity for hard work." But I feel that besides this "infinite capacity" one must also have unusual ability to do whatever work their line involves. Dr. Huntington was too well balanced a man to be called a genius, but he did have remarkably keen powers of observation, an orderly and lucid mind, and the ability to express himself clearly and simply.

Personal inspiration is an attempt at the fulfillment of the hopes and aspirations of those who have gone before. If we grant this, then the study of the life of any man who has deciphered for us a new page in Nature's book becomes a fascinating search for the reasons and causes which made it possible for him to read where others had all unwittingly thumbed the leaves. As we follow a brook up to the spring that gives it life, so we may trace a man's capabilites and characteristics through the blood of those from whom he sprang and find the source of his success. Someone must have patiently and faithfully toiled to enable others to reap the benefit, and it is an ever inspiring truth that an effort that ends in apparent disheartening failure in one generation, in the next may be crowned with glorious, and what seems sudden, success.

George Huntington's life is especially interesting from this viewpoint, for his clearly established ancestry, traced back to well known and gentle English stock, and the carefully kept records of the successes and labors of his immediate ancestors, make it genetically proper that the medical world call chronic hereditary chorea by his name.

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In 1633, Simon Huntington, of Norwich, England, and his wife, Margaret Baret, with their children, sailed for America. The father died on shipboard and the widow and children probably landed at Saybrook, Connecticut. In 1652, Christopher, the third son, married Ruth Williams, of Windsor, Connecticut, from which place he moved to Saybrook, and in 1660, with his brother Simon, aided in laying the foundations of the present city of Norwich, Connecticut.

Christopher, the son of Christopher and Ruth, was born November 1, 1660, and was the first male child born in Norwich. He married Sarah Adgate, of Norwich; their seventh son, John, married Sibil Tracy. Ezra, the fourth son of John and Sibil, married his cousin, Elizabeth Huntington.

Abel, the sixth son of Ezra and Elizabeth, and the grandfather of the subject of this paper, was born in Norwich, Connecticut, February 21, 1777. He studied medicine with Dr. Philemon Tracy of Norwich, a noted physician in the state. Dr. Abel Huntington married Frances Lee, the daughter of a Revolutionary officer. In 1797, they settled in Easthampton, Long Island, and he immediately became the leading physician of that section. That he was an advanced and successful physician and surgeon is attested by the fact that he was the first on Long Island to perform the operation of lithotomy. He was in charge of the retreat for those who had been inoculated for small-pox, and personally prepared and preserved the variola virus.

Dr. Abel Huntington was one of the first in America to take advantage of Jenner's great discovery. He was active in civil as well as medical affairs, was Presidential Elector in 1820; New York State Senator in 1821; served two years as Congressman during the administration of Andrew Jackson, and enjoyed the friendship of that stern "Old Hickory" President. In 1845 he was appointed Collector of Customs for Sag Harbor, and in 1846 was a member of the committee to revise the constitution of the State of New York.

George Lee Huntington, the only son of Abel and Frances, and the father of the subject of this biography, was born in Easthampton, Long Island, July 15, 1811. He studied medicine with his father, was a special student of the great Valentine Mott, and later received his degree from the New York University. Then he joined his father in the practice of medicine in Easthampton, where he remained for the rest of his life.

In 1833 he married Mary Hoogland, of New York City; they had two sons who followed the medical profession. The eldest of these was Dr. Abel Huntington, who was for many years the Medical Director of the New York Life Insurance Company, and the other son was the George Huntington of this paper.

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When George Huntington was born in Easthampton, Long Island, April 9, 1850, the two great factors in a man's life, heredity and environment, were both in his favor. The reader has seen that those who went before him were men of intellectual and moral power, educated, broadminded, and public-spirited; from them the boy inherited the abilities which enabled him, among other things, to observe accurately and report correctly and clearly what was interesting or unusual in his surroundings.

His environment was quaint, colorful, peaceful, and beautiful. He was a sensitive, imaginative, and observing child. It is no wonder then, as we shall see, that artistic pursuits played a definite part in his later life. He was the son of the much respected doctor of Old Easthampton, and the following picture of the village at this time is given by Dr. James Macfarlane Winfield, M.D., in his biographical sketch of George Huntington.

"It was a drowsy, secluded village at the extreme end of Long Island; settled by New Englanders, it has the attractive characteristics of their villages—the long common green, the beautiful well-kept trees, and the comfortable, substantial houses, each with an individual air combined of self-respecting, secluded dignity and kindly hospitality, the latter, however, to be dispensed only to the virtuous and the deserving from a strictly high-bred standpoint; and over all an air of peaceful home life."

"Ocean and forest were then the teachers and playground of East-

hampton childhood; a charming, soft, dreamy atmosphere hushed noisy activity and restless ambition, and woke the imagination and the faith in legends and the invisible."

This New England type of village happens to be only one mile from the ocean, and young George spent much of his time on the beach. He loved the ocean and would sit for hours watching the breakers. One time when quite a small lad he went down to the surf "bluefishing," and hooked such a big one that he put the line over his shoulder, turned his back on his quarry, and, after great effort, finally tugged his way up on the beach, dragging the fish after him. Some of his earliest attempts at sketching were of the ocean, and many of his later paintings were of the surf and of ships.

But he also loved the village life and the neighboring rustic countryside. He was quite capable of playing happily alone, and he spent many childhood hours rambling through the fields and woods where he early became familiar with the flowers, trees, birds, and animals that abounded there. Throughout his entire later life he never lost his love for nor his contact with the out-of-doors. And as a child he was noticeably fond of music, although he had no opportunities for its study.

Aside from the dignity of his home life, there was a marked intellectual atmosphere. Not only was there the medical air of his father and grandfather, but there was the more general cultural influence of his mother, who was of a fine old Knickerbocker family, a woman of education and great force of character. And also a member of the household during his boyhood was his father's sister, who was a writer of real ability, and who published several volumes of poems of charm and merit.

As a boy he attended the old "Clinton Academy" of Easthampton, and no special record of his attainments has been preserved, but one can well imagine he was glad when school let out in the afternoons, so that he could get outdoors and play. An idea of the alertness of his boyish mind and the keenness of his observatory powers can be gained from his own account of his first encounter, at the age of eight, with victims of the chorea he later described: The following is from an address he gave in 1909:

"Over fifty years ago in riding with my father on his professional

rounds, I saw my first cases of 'that disorder.' I recall it as vividly as though it had occurred yesterday. It made a most enduring impression upon my young mind, an impression every detail of which I recall today, an impression which was the very first impulse to my choosing chorea as my virgin contribution to medical lore. Driving with my father through a wooded road leading from Easthampton to Amagansett, we suddenly came upon two women, mother and daughter, both bowing, twisting, grimacing. I stared in wonderment, almost in fear. What could it mean? My father paused to speak with them, and we passed on. Then my Gamaliel-like instruction began; my medical education had its inception. From this point, my interest in the disease has never wholly ceased."

During his late boyhood and young manhood he obtained his classical education from Mr. John Wallace, a graduate of Edinburgh University, Scotland, and at one time Lord High Sheriff of Edinburgh. Outside of his regular studies, and geology and mineralogy, his reading was mainly centered on medical writings, and, as he says, he early received his instruction from his father along these lines; he also had access to the notes of his father and grandfather on the cases in their practice.

He was extremely fond of good music, and as a young man he sang in the choir of the Presbyterian church in Easthampton, having a naturally good bass voice. At about this time he also took up the flute and taught himself to play it fairly well, deriving a great deal of pleasure from it. He showed a marked ability to handle instruments and tools in his hands, not only in his sketchings and paintings, which were of ships, the ocean, and wild life, but he also made ship models with the minutest accuracy of detail.

One of his greatest pleasures was hunting, and he had many exciting experiences while out after wild geese. He knew these birds, their calls, their habits and haunts so well, that he nearly always brought a brace of them home. He hunted purely for the sport of the thing and for the providing of food, and never with the idea of slaughter; he never killed more than could be used for eating purposes. Sometimes he would sketch these specimens, and in later life he made many excellent pen sketches of game birds.

At about the age of eighteen he started in on regular preliminary

studies in medicine under his father, and then he attended and was subsequently graduated from the College of Physicians and Surgeons of Columbia University, New York, in the Spring of 1871, when he was twenty-one years of age. His thesis was upon "Opium," and following his graduation he returned to Easthampton and assisted his father in practice. Working diligently, he showed marked ability and keen powers of observation. He especially noted the existent cases and studied the notes on the old cases of the peculiar form of chorea his father and grandfather had had in their practice. They had both noticed its unusual points and his father had classified these cases. Young Huntington also became interested in the other known forms of chorea, and during the Summer and Fall of 1871 he made notes preliminary to writing a paper on chorea. He finally wrote out the original draft of his essay and it was carefully revised by his father, whose pencil notes and corrections are seen today on the original manuscript.

Late in 1871, young Dr. Huntington went to Pomeroy, Ohio, with the object of settling in practice there; a cousin of his had married a prominent clergyman there who encouraged him to take this step. He took his unpublished article with him, and on February 15, 1872, he read it before the Meigs and Mason Academy of Medicine at Middleport, Ohio. Here it was well received, and so he sent it to the editors of the Medical and Surgical Reporter of Philadelphia, and it was published in this journal in the issue of April 13, 1872. The title of the article is "On Chorea," and Sir William Osler, in writing of it refers to it as "an everyday sort of paper on chorea minor, at the conclusion of which he (Dr. Huntington) described a form which he called hereditary chorea, met with at the Eastern end of Long Island, New York, and well known to his father and grandfather, who practiced in that locality." He also wrote: "In the history of medicine there are few instances in which a disease has been more accurately, more graphically, or more briefly described."

After some two thousand words on the occurrence, symptoms, and treatment of childhood chorea, the article is concluded with the following:

"And now I wish to draw your attention more particularly to a form of the disease which exists, so far as I know, almost exclusively on the

East end of Long Island. It is peculiar in itself and seems to obey certain fixed laws. In the first place, let me remark that chorea, as it is commonly known to the profession, and a description of which I have already given, is of exceedingly rare occurrence there. I do not remember a single instance occurring in my father's practice, and I have often heard him say that it was a rare disease and seldom met with by him.

"The hereditary chorea, as I shall call it, is confined to certain and fortunately a few families, and has been transmitted to them, an heirloom from generations away back in the dim past. It is spoken of by those in whose veins the seeds of the disease are known to exist, with a kind of horror, and not at all alluded to except through dire necessity, when it is mentioned as "that disorder." It is attended generally by all the symptoms of common chorea, only in an aggravated degree, hardly ever manifesting itself until adult or middle life, and then coming on gradually but surely, increasing by degrees, and often occupying years in its development, until the hapless sufferer is but a quivering wreck of his former self.

"It is as common and is indeed, I believe, more common among men than among women, while I am not aware that season or complexion has any influence in the matter. There are three marked peculiarities in this disease: 1. Its hereditary nature. 2. A tendency to insanity and suicide. 3. Its manifesting itself as a grave disease only in adult life.

"1. Of its hereditary nature. When either or both the parents have shown manifestations of the disease, and more especially when these manifestations have been of a serious nature, one or more of the offspring almost invariably suffer from the disease if they live to adult age. But if by any chance these children go through life without it, the thread is broken and the grandchildren and great-grandchildren of the original shakers may rest assured that they are free from the disease. This you will perceive differs from the general laws of so-called hereditary diseases, as for instance in phthisis, or syphilis, when one generation may enjoy entire immunity from their dread ravages, and yet in another you find them cropping out in all their hideousness. Unstable and whimsical as the disease may be in other respects, in this it is firm, it never skips a generation to again manifest itself in another;

once having yielded its claims, it never regains them. In all the families, or nearly all in which the choreic taint exists, the nervous temperament greatly preponderates, and in my grandfather's and father's experience, which conjointly covers a period of seventy-eight years, nervous excitement in a marked degree almost invariably attends upon every disease these people may suffer from, although they may not in health be over nervous.

"2. The tendency to insanity, and sometimes that form of insanity which leads to suicide, is marked. I know of several instances of suicide of people suffering from this form of chorea, or who belonged to families in which the disease existed. As the disease progresses the mind becomes more or less impaired, in many amounting to insanity, while in others both mind and body gradually fail until death relieves them of their sufferings. At present I know of two married men, whose wives are living, and who are constantly making love to some young lady, not seeming to be aware that there is any impropriety in it. They are suffering from chorea to such an extent that they can hardly walk, and would be thought, by a stranger, to be intoxicated. They are men of about fifty years of age, but never let an opportunity to flirt with a girl go past unimproved. The effect is ridiculous in the extreme.

"3. Its third peculiarity is its coming on, at least as a grave disease, only in adult life. I do not know of a single case that has shown any marked signs of chorea before the age of thirty or forty years, while those who pass the fortieth year without symptoms of the disease are seldom attacked. It begins as an ordinary chorea might begin, by the irregular and spasmodic action of certain muscles, as of the face, arms, etc. These movements gradually increase, when muscles hitherto unaffected take on the spasmodic action, until every muscle in the body becomes affected (excepting the involuntary ones), and the poor patient presents a spectacle which is anything but pleasing to witness. I have never known a recovery or even an amelioration of symptoms in this form of chorea; when once it begins it clings to the bitter end. No treatment seems to be of any avail, and indeed nowadays its end is so well known to the sufferer and his friends, that medical advice is seldom sought. It seems at least to be one of the incurables.

"Dr. Wood, in his work on the practice of medicine, mentions the

case of a man, in the Pennsylvania Hospital, suffering from aggravated chorea, which resisted all treatment. He finally left the hospital uncured. I strongly suspect that this man belonged to one of the families in which hereditary chorea existed. I know nothing of its pathology. I have drawn your attention to this form of chorea, gentlemen, not that I considered it of any great practical importance to you, but merely as a medical curiosity, and as such it may have some interest."

The remarkable things about this article, as I see it, besides the fact that it is an original description of a disease, are its accuracy, its vividness, its briefness and yet its absolute completeness and clearness; so much so that the picture is unmistakable, and every word of it still holds good today. No one could alter it in any way and improve upon it. Dr. J. M. Winfield writes of it as follows: "This article is classic in its accurate, unmistakable characterization of symptoms, and from this word picture any tyro could recognize Huntington's Chorea. It is natural that this hopeless disease with its hideous and grotesque symptoms should strike sharply on the artistic, beauty-loving intellect of the young physician and crystallize in a description of photographic, almost living, accuracy."

Dr. William Browning, of Brooklyn, New York, wrote concerning it: "Our knowledge of this form of chorea dates entirely from the article by Dr. George Huntington, in 1872. There were good reasons why his paper succeeded in drawing general attention to this disorder and in securing for it permanent recognition. They are:

"(1) Huntington was the first to give definitely the location of his cases, and thus positively establish a verifiable record. It is a dictum of experimental medicine as well, that only what is verifiable can be accepted.

"(2) The abstracting of his original article by Kussmaul and Nothnagel, in Virchow-Hirsch's 'Jahrbuch' for 1872.

"(3) Thanks to the work of Friedreich on hereditary ataxia, as well as the growing interest in heredity, the time was ripe for its appreciation.

"Only work of unusual incisive and wide reaching interest could attract such a share of attention. What he described had interest both as a disease and in its bearings on questions of heredity. As one

corollary it removed the age limit, demonstrated at a sweep that the hereditary factors can become dominant at any period of life."

Concerning the earlier writings on this disease, Sir William Osler writes: "In the first edition of Dunglison's 'Practice of Medicine,' published in 1842, on page 312 of volume two, he gives a letter from Dr. C. O. Waters of Franklin, New York, in which an affection is described as prevailing in the Southeastern sections of the state, where it was known as 'Megrims'. . . . 'consisting of a spasmodic action of all or nearly all the voluntary muscles of the system . . . . of involuntary and more or less irregular motions of the extremities, face, and trunk.' Waters did not notice the association with dementia.

"The next description, also from New York state, is found in the American Medical Times for December 19, 1863, in an article on Chronic Hereditary Chorea, by Dr. Irving W. Lyon, House Physician, Bellevue Hospital. No mention is made of the section of the state from which the cases were found. He says the disease is confined to certain families, popularly designated as 'megrim families.' The hereditary transmission was fully recognized in the community, and the people would interdict intermarriage with a tainted family with the penalty of social ostracism. Dr. Lyon tells of cases through five generations, but gives no details, and does not recognize the mental deterioration."

The next work on the subject is Dr. Huntington's accepted article, which has been given above. For final comments on the famous paper it is interesting and fitting that we see what ideas its author had concerning it. Dr. Huntington, in his address before the New York Neurological Society in 1909 said: "It must also be remembered that, without the facts and observations handed down to me by my grandfather, Dr. Abel Huntington, and my father, Dr. George Lee Huntington, the medical lives of whom both were spent in Easthampton, Long Island, and whose memory is still cherished there by the few remaining who once knew them—I never could have formulated a picture of the salient characteristics of the disease so true and so complete as to make of it a so-called classic. As in old Greece the pupil sat at the feet of his teacher, so your essayist sat at the feet of these two, and whatever of honour, whatever of praise, whatever of scientific worth there is, is due much more to them, than to him to whom has come this unsought, unlooked for honour."

This statement, while true to a great extent, does not detract from the honour due Dr. Huntington in the least; rather than this, his dignified modesty shows his true character.

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Early in 1782, young Dr. Huntington met Miss Mary Elizabeth Hackard, the daughter of Judge Martin Hackard of Pomeroy. He was struck by her charm, intelligence, and energy, and thus followed a two year courtship, which culminated with their marriage in 1874. By this time the young Doctor had come to realize that Pomeroy was abundantly supplied with physicians, and that the chance for successful competition seemed small, so he took his young bride back to Easthampton with him. It was about this time that he began to suffer from severe attacks of spasmodic asthma, and this disease was gradually to become a more and more important factor in his life. After a few months stay in his native town, the young couple decided that it would be best for them to move to La Grangeville, which is in Dutchess County in the Catskill Mountains of New York. There they were to try their fortunes in life. Accordingly, in the Fall of 1874, they arrived at this town, and the local residents soon began to come with their troubles to the home where hung the bright new sign "George Huntington, M.D."

One wonders why a young doctor, who had written a paper at the age of twenty-two years which gained him fame both home and abroad, did not go to a large city and there live in the emulation of an engaging practice. He could have done it; he possessed a charming personality, a brilliant intellect, and a ready wit and sense of humor. But instead he chose the life of a country practitioner in a small isolated country village. Several factors led him in this choice. He was, as we have seen, a lover and student of Nature and her woodcraft secrets, and an ardent devotee of the rod and gun; and this, coupled with a retiring, highly refined, and idealistic temperament added great weight to his choice of the individual and peaceful life of the country practitioner over the social prominence and glory of a city practice. Although he never mentioned it himself, as he was never known to complain of any ailments, his asthma attacks had increased in severity and they often put him to bed for several days. It is believed by those who knew him best that his health would not have stood up under a city practice.

He realized this all too well himself, and if he had ever had any special desire for the city professional life, he soon became cognizant of the fact that such a thing was inadvisable.

Dr. Huntington soon won the hearts and the trust of the people in the neighborhood, and he was kept busy by the demands of an ever increasing practice. These were happy days indeed for the young couple, and soon their household was blessed with a new member, a little son, who was called Charles Gardiner. This advent brought into more prominence the family economic condition, and although the Doctor's practice was a good one, the people were mostly poor mountain farmers and many of "the fees were taken in hay, straw, oats, corn, chickens, pork, mutton, and quarters of beef." The regular fees were very small in comparison with those of today; a list of these charges would seem absurd to the modern city practitioner. Office calls were 50¢, and included medicine; house calls were $1 to $1.50 depending on the number of miles driven; maternity cases and consultations were $5. But Mrs. Huntington was thrifty, a capable manager, and a source of inspiration and joy for the Doctor; and so their happiness was absolute.

In due time there were other additions to the family group; next came Edwin Horton, then Catherine, Elizabeth, and Eleanore. There was thus a family of seven, and all of the children that were old enough had their definite duties and chores to do. Dr. Huntington continued to have his attacks of asthma, and was sometimes in bed two weeks at a time in the winter. However, he never complained nor mentioned the state of his health to anyone, and it was not until his children were older that they realized his poor condition and the limitations it put upon him. The family was many times with only the barest necessities of food and clothing, and there was only enough cash for the mortgage interest and the taxes. In several incidences they could not have kept going had it not been for the generosity of his brother Abel. But, notwithstanding these conditions, they all pitched in and made a happy go of it.

The children were growing up now, the two sons were able little fellows and were a great help to their mother, and a constant source of pride, though never openly manifested, to their father. The daughters were still young, but they did their share of the household duties. Many an evening after supper, a caller would find Mrs. Huntington

at the piano and the Doctor standing beside her, accompanying her on his flute. Both they and the children were musical, and soon, young Edwin, under the tutelage of his parents, was able to join in with his violin. The children today recall the joy of these musical evenings, which were made the more enjoyable by the fact that, with the exception of Mrs. Huntington, who had studied the piano for several years, the other players were naturally musical and were for the greater part self-taught.

When Dr. Huntington would hitch up his horse and buggy and go out across country in answer to a call, he would often take one of the children with him. Such a ride, to be assured, was a delight for both father and child, for on the way the Doctor would point out many things of interest concerning the geology and mineralogy of the countryside, in which he was well versed. He also knew all the birds, the trees, the flowers, and animals that were to be seen and he instructed his children concerning them.

There were several lakes in the neighborhood, and Dr. Huntington greatly enjoyed fishing them. He would be content to sit for hours in a boat, whether the bass were biting or not, but it seems he always brought a "mess" home. He also hunted quail, grouse, geese, ducks, snipe, and woodcock in season, from which he derived great sport. Oftentimes, before his catch was picked, cooked, and served up, he would sketch in pen and ink the best specimens and these sketches are marked by their life-likeness and their accuracy of detail. Late one Fall he shot a beautiful pair of quail, male and female, and he allowed them to freeze, subsequently painting them during the winter. They are life size and beautiful in the minuteness of line and coloring. He had some prize setter dogs, of whom he was very fond, and he always favored them in their service, and trained them to be excellent bird dogs.

Of his children he was very fond; he was just and impartial with them, and was sympathetic and considerate of all their troubles, physical or otherwise. Any show of affection towards them was with reserve and dignity. He instructed them in all the things he was interested in, in music, nature, reading, and he encouraged them in their school work. His second son says: "He never allowed us and taught us never to allow kissing on the mouth, because of possible conveyance

of disease." He encouraged his children to follow their own "bent" and to work hard, and he never planned or suggested careers for any of them. His attitude toward his children is indeed indicative of great wisdom and understanding of human nature, and his prohibition of kissing is not only interesting as a character index, but from the standpoint of his medical views as regards disease transmission.

Dr. Huntington possessed a good imagination, and he used to make up, for his children's amusement, a continued story out of his head, with a chapter lasting about half an hour every night for a week. The stories were more or less humorous, and usually had a moral. He was very adept at a play on words and at making puns, and he wrote some extremely amusing letters to his brothers and sisters telling all the family news in rebus. He also played many pranks on the children, and enjoyed a practical joke whether it was on him or on the other fellow.

His keen sense of humor often prompted him to caricature, mostly concerning the family life of his children, but he often "took off" some of the well known characters of his daily life. This he could do to perfection, and when he could be coaxed to perform, gales of laughter from the "coaxers" was the result. Of the anecdotes told of his rare wit and sense of humor, one especially stands out.

It seems there was a character on a neighboring farm by the name of Jim Kelly, who was direct from the "auld sod," and who had such a brogue he could be scarcely understood. One Saturday night late, Jim came to Dr. Huntington's office reeling drunk to have a laceration dressed on the top of his bald head. After he was cleaned up, the Doctor drew the wound together with a long strip of adhesive. Then he also placed a shorter strip across the first one near one of its ends to hold it in place, and he said, "Now Jim, this will get well all right because I have made the sign of the cross on you." This brought forth from Jim a burst of blasphemous language which included the Church, the State, and all the Protestants. "All right, Jim," said Dr. Huntington, while applying another strip, "I've put another strip on here, making the letter H, which stands for Hell, and that is where you are going just as fast as rum can take you." Jim said no more and went humbly out when the dressing was completed. The Doctor had a naturally reverent nature, did not like to hear vile language, and especially had no patience with an intoxicated person.

He was never the aggressive type, but was mild mannered and easy going; he disliked bickering or contention of any kind, and would allow none to take place in the home. He was very patient and only when tried to the uttermost would he explode with a burst of temper, stormy and short. He never held a grudge and would not hurt a persons feelings if he could help it.

Of his reading, we know that he dabbled a bit in geology, minerology, Nature, and some classics, but most of the time he spent thus was devoted to medicine; he never put aside a medical journal unread, and he kept his medical library up-to-date. His most definite aim in life was to improve his medical knowledge and keep abreast of the rapid advances in the medical sciences. He had definite powers of concentration, retained what he studied, and applied what he learned to his professional needs wherever possible.

He ingeniously used his imagination and inventive powers in his work. One night in winter, in a drifting snowstorm, he went to see a man who had a strangulated inguinal hernia. The patient had been vomiting most of the day, not realizing what the trouble was. Morphine and the usual efforts at reduction brought no results. The weather and deep snow forbade moving the patient fourteen miles to a hospital in an open sleigh, so he conceived the idea that if the gas could be expelled from the strangulated gut, reduction might be accomplished. So he took his hypodermic needle and pierced through into the intestine, thus allowing the flatus slowly to escape, following which reduction was easy, and the patient's life was saved.

Many a night some farmer's boy or a young husband would gallop up to the Doctor's home with the breathless message of "Mrs. Jones is laborin' bad," and "Could Dr. Huntington come right away." The good Doctor would hurriedly throw on his clothes, grab his instrument case and his hat, pick up and light a lantern as he went through the kitchen, and go out to the barn. Here he would lead a drowsy horse between the shafts of his buggy, hastily hitch her up, and be off down the road. Finally the horse would "come to" and would break into a gentle gallop, and the Doctor would wonder if he would beat the stork to the bedside. Sometimes the stork won, but more often it lost. A few hours later the Doctor would be on his way home, the stars would be rapidly disappearing, and the horse trotting along, expectantly sniffing the fresh early morning air. He would arrive home

just as the first rays of the sun were filtering over the Catskills, and would have time to bathe, shave, and dress before breakfast, and be in his office at his usual hour of seven A.M.

To his country people he was physician and friend, adviser, and, oftentimes, minister. Of many instances where he served all these functions, there is one he is especially remembered by. A child in a poor family died of diphtheria. The father was sick, and the poor mother in a collapse of grief. The good Doctor built a little coffin, arranged the child in it, and read the Episcopal burial service at the grave in a private burial ground. He never refused to treat a patient who was too poor to pay, and because of this, many of them, in later and better years, came to him with their long owed fees.

In any repair work of any kind around the house he was adept. Being naturally handy with tools, he did some excellent inlay work in the repair and renovating of antique furniture. He made a fine model in detail of the yacht "Defender" at the time it raced against Sir Thomas Lipton in an attempt to keep the cup on this side of the Atlantic.

Throughout all this time his attacks of asthma were persistant and very discouraging to him. He never had asthma while on shipboard, and along in the nineties he was forced, as a recuperative measure following a two or three week illness, to take several sea voyages of a few weeks duration. They were mostly coastwise trips, several of them to Southern waters, and one of them was on a steam freighter running from New York to Halifax. This trip was especially exciting as they had a thrilling time in storm and fog, but there were no mishaps. Longer trips were not permissable due to the lack of money, and his vacations, like most of his activities, were not of his own choosing, but were dictated by his ill health. As his son, Dr. E. H. Huntington writes of him, "It was his poor health and economic conditions which governed and directed his life" and "He never complained—at least his children never knew what he had to contend with."

By this time his two sons had become young men. Charles, the oldest, went to Polytechnic Institute in Brooklyn, New York, worked his way through, and graduated in chemistry. He then went to work for a chemical concern, and devoted his time to nitrates and nitrites. Here due to pulmonary irritation, he too developed asthma, and went

to South Carolina, where he went into the manufacture of artificial ice. The second son, Edwin Horton, had followed his violin closely all through his school days, and when he went to college, preparatory to going to medical school, he took the violin with him. When he was eighteen and had only been there a year, he gave up college to study the violin. Although his father never said anything about it, it nearly broke his heart, especially since he was so overjoyed that Edwin had chosen to follow the Medical profession of his own volition. But Edwin studied the violin for a while, did very well with it, and returned to college again. Here he used his ability on the violin to work his way through, as he later did in Medical College, from which he, in due course, graduated. Edwin did not know how his father really felt about his choosing "the profession" for his career until, just after the graduation exercises were over, his father rushed up to him, took both his hands in his own, and said, "Ed, this is one of the happiest days of my life!"

In 1901, Dr. George Huntington's health forced him to leave La Grangeville and go to Asheville, North Carolina. Here he practiced medicine and joined the state society. He stayed for two years, during which time his health improved markedly and he was built up so well that he was able to remain in active practice for the subsequent twelve years.

In 1903, he returned to Dutchess County and settled at Hopewell Junction. He took up practice again and was able to be more active than formerly, due to his improved health. At this time we find, on reading his professional letterhead, that his office hours were from 7–8 A.M., 1–2 P.M., and 7–8 P.M. In between these periods he was answering calls around the countryside in his horse and buggy.

His sons were away from home, but some of his daughters remained for a while. His wife was a woman of deep Christian convictions, as he was also, and while her devotion to her family was great, her devotion to her husband was even greater. Their lives were so intertwined that it is difficult to interpret them separately. They were greatly dependent on each other; he was possibly more dependent on her, due to her health and strength. She was quick and alert in mind and body, and was his keeper and counselor, and theirs was one of those rare perfectly matched, happy marriages.

By this time the oldest son, Charles, had improved in health, and had gone to Chicago with the Northwestern Bank Note and Engraving Company, where he held a splendid position, and was doing very well. Dr. Edwin H. Huntington had taken up practice in Cairo, New York.

Dr. George Huntington was very active in the Dutchess County Medical Society, which he had joined back in 1874. He was its vice president in 1887, and president in 1888. He joined the Medical Society of the State of New York in 1880; and became an honorary member of the Brooklyn Society for Neurology in 1898. He was a member of the Buncombe Medical Society of North Carolina from 1901–1905, and joined the Tristate Medical Association (Va., N. C., and S. C.) in 1903. In 1905 he joined both the A. M. A. and the Medical Association of the State of New York; and he had been for many years a member of the New York Audubon Society. He was, after settling at Hopewell Junction, for ten years the health officer of the township of East Fishkill; and was also visiting physician to the Matteawan General Hospital.

Dr. William Browning of Brooklyn, New York, in 1908, edited a special edition of "Neurographs," a neurological publication, in honor of Dr. Huntington and his chorea. It began with an editorial which stated that the purpose of the issue was "to honor him (Dr. Huntington), and partly to clear up the records" concerning Huntington's Chorea, as quite a bit of work had been done on tracing the choreic families by this time, and over it much discussion had arisen. It also contained a biographical sketch of him by Dr. J. M. Winfield, a reproduction of his 1872 article, and several articles on the pathology of the disease, one by Prof. Dr. Adolph Strumpell of Breslau, and one by Doctors M. Lannois and J. Paviot of Lyon. There are historical notes on the disease by Sir William Osler, and Dr. S. E. Jellife. Dr. J. Tilney has an article on a family in which the choreic strain is traced back to colonial Connecticut, and Dr. A. R. Diefendorf, of Yale University Medical School gives an article on the mental symptoms of the chorea. There are biographical sketches on both Dr. Waters and Dr. Lyon, and Dr. William Browning closes the issue with a note on the "Temporal, Geographic, and Racial Distribution of Huntington's Chorea." This issue is quite a tribute to Dr. Huntington, and one which he did not expect. In it the controversy over who was the first

rightful describer of the disease was decided definitely in favor of Dr. Huntington, as the other men's descriptions had either been inadequate or they had failed to locate their cases.

The New York Neurological Society invited Dr. Huntington to deliver the address at their regular meeting on December seventh, 1909. In this interesting paper he added some new facts to the history of the disease, and also gave some colorful personal reminiscences. It is in part reproduced as follows:

"Mr. President and Gentlemen of the Society:

"In appearing before you this evening at the solicitation of your honored President, it is with many misgivings of my ability to make good, but when you learn that I have seen practically no cases of the disease in question during the long period that has passed since the laboration and reading of my original paper, now thirty-seven years ago, I feel confident that the effort that I now make will be generously received, and temperately criticized.

"Old Easthampton was settled by the English in the year 1649, and was first called Maidstone, after the old home of many of them in England. They had spread Eastward from South Hampton, whither they had come from New England, principally from Saybrook and its vicinity in Connecticut, and settled several years prior to the settlement in Easthampton. With these earliest settlers, in all probability came the disease under consideration, and I think I can use the time to no better advantage than quoting from a letter I received from one of Long Islands oldest and noblest men, Judge Henry P. Hedges, of Bridge Hampton, now ninety-two years of age, but with mind and memory still active and alert, though feeble in physical strength. He writes from Bridge Hampton, July 9, 1908, and says, "I am confident this disease is not of Easthampton origin, but was introduced there from Southampton. The subject is avoided by most people as distasteful. J.T.D., father of E.D. of Easthampton told me forty or fifty years ago that it was introduced into Easthampton first by the intermarriage of an Easthampton Mulford with a Howell woman of Southampton. Capt. John Dayton (5th), born in 1728, died in 1825, was married to Mary Mulford, September 1751, and his son Josiah (6) had this chorea and also his son John (6), and his son Samuel (7). This chorea came into the Hedges family by the marriage of Capt.

David Hedges, born September 8, 1762, died 1846, through his wife Phebe Tillinghast, and their son Stafford had it. I knew seventy years ago a Howell woman who was the wife of Charles Topping, and through whom the disease passed to men now living. I knew Jesse Pierson of Sagg eighty years ago who had this disease, and of his five children, four died of it, all of whom I knew."

"I presume that Judge Hedges is quite right about its first appearing in Southampton before it reached Easthampton, but I believe that it had its origin long before any settlers reached Long Island, in New England almost certainly, in Old England probably.

"My grandfather came to Eastern Long Island from Connecticut in 1797, now 112 years ago, and he found the disease well established there, but had little or no call to treat it, though he undoubtedly treated many choreics for any intercurrent disease that might affect them, and was thrown more or less intimately with them. The same is true of my father, Dr. George Lee Huntington, who was a native of Easthampton. Years of contact with these people taught them their peculiarities, the age at which the disease generally manifested itself, its usual slow onset and gradual development, sometimes through long lives, sometimes for only a short period, for these people often end it all by suicide before its worst features have had time to develop. Some worked on at their trades long after the choreic movements had developed, but gradually succumbed to the inevitable, becoming more and more helpless as time advanced, and often mind and body failed at even pace.

"In a recent conversation with one of Easthampton's physicians, I learned that there are but two cases existing in Easthampton Township at present. I was greatly surprised at this, and if true, it argues that the disease is surely dying out there, a thing devoutly to be desired. Stephen C. I knew in my early boyhood. He was an old man, insane, and a terror to the boys. Although fully entitled to be a choreic, he never became one, and ***none of his posterity*** have ever developed the disease, nor have they ever become insane. The two women mentioned previously by me (those he saw when he was a boy) were near relatives of his of the same name, and cotemporaries.

"The postulates taken in the original paper I believe hold good today, viz., the appearance of the disease only in *adult* life, its *chronicity*

and gradual advancement, its following in direct line from parent to offspring, and *when this line is broken*, its *failure to reappear in future generations*. In this connection, in a recent communication from my friend Dr. William Browning of Brooklyn, he says, 'Your original dictum that persons living out their time do not transmit the strain, still holds good as far as I am aware. One or two claimed exceptions may doubtless be otherwise explained'.

"This, gentlemen, about completes what I have to say. None knows better than I how far it falls short of what is usually heard in these halls, for I have made no attempt at the scientific, but if you have derived either profit or pleasure from it, I shall consider my efforts as abundantly repaid."

* * * * *

In the village of Bures, in Suffolk, England, we know that prior to and in the year 1630 there were quite a few witches, as the records tell of many "witch-hunters" canvassing this region and ferreting out and jailing any suspects, for which they received twenty shillings apiece from the government. Of the nervous disorders most of these witches suffered from, we can be sure that at least some of them were Huntington choreics. Those who were thus affected, in this locality, were spurned by the general populace because they were firmly believed to be in league with the Devil and many were condemned and beheaded for witchcraft. This group and their as yet unaffected offspring were forced to band together and live to themselves. As a result, intermarriage among their children was the rule, and thus these people not only suffered the ill-effects of intermarriage of cousins, but their children were doubly sure of being potential choreics.

A young man of Bures, by the name of Jeffers, and not of choreic strain, fell in love with the daughter of a choreic and wished to marry her. His family stoutly objected, and so to obtain his end, he, in 1630, had to marry her and take her to America. This he did, finally settling in Stamford, Connecticut. Another young man of Bures named Nichols, who was of choreic strain, married a woman named Ellin, likewise of this strain, and they came to America on one of the boats of John Winthrop's Fleet on the same voyage with Jeffers and his bride.

New England Court records show that Nichols and Ellin were in several scrapes with the law for various types of rascality, and finally, Ellin, in 1653 was condemned and hanged for witchcraft. Her granddaughter was likewise convicted of witchcraft in 1692, but was pardoned by the judges, who, by this date, had begun to feel that they might be committing crimes themselves for hanging these poor stricken individuals.

Wilkie, older brother of Nichols, also came over at the same time with his wife Priscilla. This pair was involved in several court trials for various misdemeanors, and their eldest son was taken into custody in 1641, charged with "distemper," and he later was apprehended stealing some of his mother's silver. The daughter of another son became the celebrated Groton Witch, referred to in all witchcraft literture.

The most interesting offspring of Nichols and Ellin was a daughter who married a man named Mulfoot (Mulford), and then going with him, in about 1660, to live in East Hampton, Long Island, thus forming the parent stem of Dr. Huntington's Long Island group of choreics. This is then the origin of the Mulford strain, and it is interesting to note, one hundred years later, the dissention as to what family was responsible for the Mulford taint at that time. The Easthamptoners and the Mulfords blamed it on the Southampton Howells; the Southamptoners, some of whose families also harbored the taint, blamed it entirely on the Mulfords. It is probable that all of the choreic strains in both villages came from the original Mulfords.

* * * * *

Although Dr. Huntington was now in his sixtieth year, he continued in active practice. While the recognition paid him undoubtedly pleased him, he never could feel that he deserved it, and he felt that he was receiving honors which rightfully belonged to his father and grandfather. But if we look into any similar cases, the parents and grandparents all helped contribute in some way to an individual's success.

He and his wife were now out of financial difficulties, and they lived in the old homestead at Hopewell Junction amidst the rich rewards they were receiving from their well spent lives. Their children, now successful men and women, paid them visits, and these meant much to

the old couple. Dr. Huntington, when seated in his favorite armchair, enjoying a few hours of rest from his practice, could let his eye rove around the room over the sketches and paintings of the quail and geese, and the ships and sea, and each one recalled definite memories of the past. He loved to think of the joy and the struggle of the early days at La Grangeville, he loved to recall his children as they were in their infancy. He and his splendid wife realized the fullness of their companionship in these years, and it was through her faithful, sympathetic, and loving ministration, particularly in his periods of illness, that he was able to 'carry on.'

In the Spring of 1915, he was persuaded by his children to give up his practice, and he went to live with his son Edwin at Cairo, New York, also in the Catskills. It was his sons' desire that his declining years be free from all responsibility, but, during the following winter, the fine old gentleman had a persistant severe chest cold, and in February, 1916, he developed broncho-pneumonia, and on March the third, in his 66th year, he died. His wife remained with her son and lived to attain the age of 71, dying in 1921.

* * * * *

His classic paper is his most popular claim to fame, but if his life as a country practitioner was not brilliant, it was certainly extremely colorful. And if his career subsequent to his publication on chorea may be thought by some to have fallen short of his potentialities, it was his own doing; he was determined to lead the life which would give him the greatest amount of satisfaction and happiness. Although his ill health obviously guided his life to some extent, I feel that his sterling character, high ideals, and love of the rural life were the chief forces which led him to follow the useful but strenuous existence found in a country practice.

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THE USE OF THE HEBREW LANGUAGE IN MEDICAL LITERATURE

HARRY FRIEDENWALD

The purpose of this study is to determine to what extent Jewish physicians of different periods in the history of western civilization chose the Hebrew language as the vehicle of their medical observations, and experiences, and to show what demands there were for medical tracts and books in the Hebrew language.

Much of the material that would serve us has probably been lost during the centuries, and no small amount may have been destroyed in the innumerable "Autos-da-fe" of Hebrew books suspected of heretical content. Such destructions occurred in many places, and during a long period of time.[1] Habent sua fata libelli, or as the Zohar expresses it even more forcibly "Hakol tolui vemazol aphilu sepher torah shebeheechol" (Everything depends on luck even the scroll of the Torah in the ark). It is hardly to be supposed that books on medical sub-

[1] Hebrew books suffered at times in company with those of other languages (burning of philosophical works in Bagdad in 1150; and of the library of Budapest when that city was taken by the Turks; the latter is said to have been rich in Greek and Hebrew lore). It was because of suspected anti-Christian references that the Talmud in particular was often put to the flames. In 1242, twenty-four cartloads of Hebrew books were burnt in Paris, and this was followed by similar destruction in the provinces of France, in Perpignon, Toulouse (early fourteenth century). In Italy the furies were let loose in the sixteenth century. In Rome "hundreds of books" were destroyed in 1553; in Bologna, Ferrara, Mantua, Padua, and Venice ("thousands of volumes"), Milan, and finally Cremona ("ten thousand volumes" 1557). The same public amusement was indulged in later in Poland in the middle of the 18th century. (See Graetz, History of the Jews III, 542, 574, 579, IV, 50, 55, 565, 583, 654. Dubnow, Weltgeschichte des juedischen Volkes, V. 41, 44, 91, VI 108, 109, 115, 125, 126, 193, VII 201. Encyclopedia Britannica XI edition, II 279, XIV 591. Prescott, Ferdinand and Isabella, Lippincott, Philadelphia, 1872, II, 413. Dudley Wright in "The Talmud," London 1932 devotes an entire chapter to burning of the Talmud. See, also, Steinschneider on the vicissitudes and the destruction of Hebrew books and manuscripts in "Vorlesungen ueber die Kunde hebraesch Handschriften" &c., Beiheft zum Centralblatt fuer Bibliothekwewen 1897, p. 57.)

jects were carefully separated and preserved by those who were actuated by intense bigotry and passion. A Jewish historian notes that at times entire libraries were destroyed.[2]

In spite of the destructive effects of time and of vandalism, there still is a large mass of Hebrew medical literature extant. We owe it to one scholar especially, that its bibliography has been made accessible,—to Moritz Steinschneider (1816–1907), the "Father of Hebrew Bibliography," and one of the greatest bibliographers of all time, who for more than sixty years labored continuously at this task; the fruits of his researches are prodigious.[3]

ASAPH

The earliest Hebrew medical Ms. extant is the work attributed to Asaph. It is called *Sefer Asaph*, *Midrash Refu'ot*, or *Sefer Refu'ot*—, and there are four copies known in the libraries of Florence, Paris, Munich, and Oxford. These Mss. have been studied by Steinschneider,[4] and more recently by Venetianer, who published an extensive monograph describing the work and translating it.[5] The origin of the work is doubtful. Steinschneider believed it to be a translation from a Syriac work. Venetianer regarded it as the work of one Asaph Judaeus, who he believed lived in Mesopotamia at the latest in the seventh century. Sarton places him later, "in ninth or tenth century (,)."[6] Venetianer, likewise, used the Munich Ms. for his studies. This Ms. is one of three hundred and ninety-six pages. It opens with a legendary account of the history of medicine. An account of the composition of the body from the four elements follows; then, the anatomy and physiology of the bones, blood vessels, brain, liver, spleen, gall, heart,

[2] Dubnow, loc. cit. VI, p. 109. Graetz, loc. cit. IV p. 565.

[3] "Bibliographie der Arbeiten Moritz Steinschneiders zur Geschichte der Medizin und der Naturwissenschaften." Von Fielding H. Garrison, Baltimore, Maryland, Sudhoff's Archiv für Geschichte der Medizin. Bd. 25, Heft 3, 1932.

[4] Hebraeische Bibliographie 1879, Vol. 19, pp. 35, 64, 84, 105. Steinschneider mainly used the Munich Ms., but also had notes on the others. He gives a detailed account of the contents.

[5] Asaf Judaeus, Budapest, 1916–17. See, also, Gottheil, Jewish Encyclopedia, "Asaph." Sarton, Introduction to History of Science I, p. 614. This great work is a most valuable work of reference for the subjects treated in this essay.

[6] Sarton, Introduction, &c. I, p. 614.

kidneys; embryology; next there is a discussion of the four humors, of food and nutrition; then follow chapters on the special diseases pertaining to the several months; the diseases of the different organs and their treatment; next, one hundred and twenty-three herbs are described with notes on their healing powers; a book of prescriptions; a list of antidotes; the aphorisms and prognostics of Hippocrates in paraphrase; rules of uroscopy; symptoms of the pulse; and fevers. The book closes with a form of oath[7] similar to that of Hippocrates.

I have recently acquired a Hebrew medical Ms. from Mr. Jacques Rosenthal of Munich, which contains portions of this work. This Ms. is described in Appendix A at the end of this article.

DONNOLO

The first European Jewish medical author whose name we meet with is Sabbato ben Abraham Donnolo. He lived in Southern Italy, was born in 913 and he was still alive in 982.[8] He studied the sciences in the "land of the Romans," probably in Salerno; medicine and astrology were his special interests. He traveled extensively. "Donnolo and perhaps many other physicians of his kind acted as a ferment amidst the mixed population of the South Italian harbors. It is probably to him or to physicians like him that we have to look to understand the birth of the School of Salerno, the earliest original school of medicine in Christian Europe."[9] Donnolo wrote a commentary on the "Book of Creation"—a mystical work. A fragmentary Hebrew work by Donnolo on pharmacology was discovered in the last century by Steinschneider who published it,[10] and carefully studied[11] it in its relation to the history of mediaeval medicine. We know little about Donnolo or the circumstances under which he lived and worked. That little

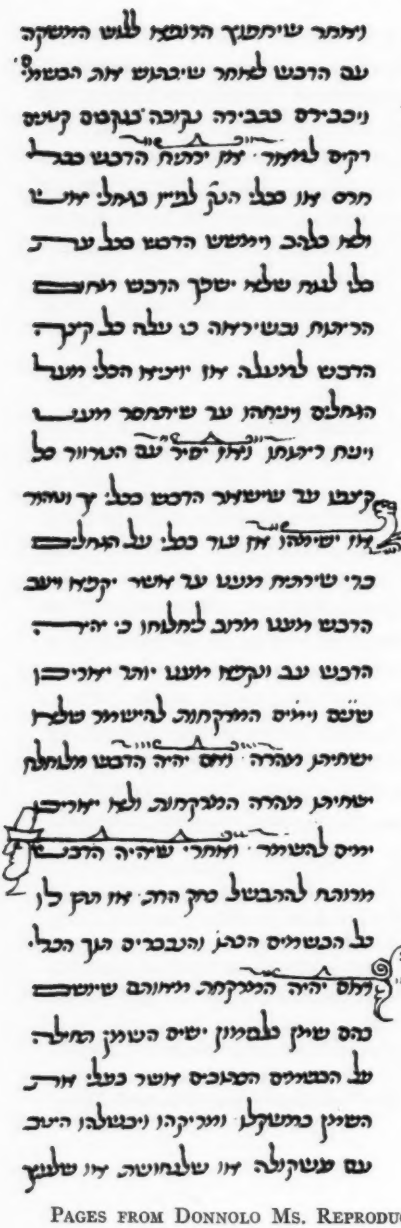
[7] See author's "Ethics of the Practice of Medicine from the Jewish Point of View," Johns Hopkins Hospital Bulletin, 1917, Vol. 28, p. 257.

[8] Revue des Études Juives, Vol. XXII, p. 215.

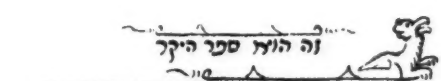
[9] Sarton Introduction I, 651. See, also, Singer, "Origin of the Medical School of Salerno" in essays on the History of Medicine, presented to Karl Sudhoff, Edited by Singer & Sigerist, Zurich 1924, pp. 133–136.

[10] Steinschneider, Donnolo. Fragment des aeltesten medicinischen Werkes in Hebraeischer Sprache, Berlin, 1867.

[11] Steinschneider, in Virchow's Archiv für Pathologie, Anatomie und Physiologie, vols. xxxviii, xlii.



Pages from Donnolo Ms. Reproducing Beginning of Sepher ha-YaKar



Donnolo

is derived from a few statements which he makes in the introduction to his commentary and from a few references to Donnolo in the biography of Saint Nilus, the younger, the abbot of Rossano. These may be found in the writer's account "Jewish Physicians in Italy: their relation to the Papal and Italian States."[12] Asaph is cited by Donnolo.[13] Steinschneider described the Ms. on drugs by Donnolo as unique and no other copy has since been recorded. But a second was discovered by Professor Marx in the Ms. described in Appendix A (fol. 75c-78d) in form almost identical with that of Steinschneider's, and is the only other copy known. The medical fragment referred to is not only the oldest European Hebrew medical writing, but also the earliest Italian medical work after the fall of the Roman Empire. It contains an enumeration of 120 medicinal remedies. What is most interesting and important as shown by Steinschneider is that though written at the peak of the Arabic period, it is based upon Greek medicine and almost free from Arabic influences; which proves that Greek medicine had been preserved in southern Italy, and had not yet succumbed to the domination of Arabic medicine.

ARABIC PERIOD

We may now take up the Arabic Period which Garrison describes as the "Mohammedan and Jewish Period,"[14] and concerning which Campbell[15] writes: "Although we have called this space of time the 'Arabic Period,' it can with justice be termed 'The Jewish Period' as the Jews were closely identified with the medical culture of Islam in general, and the Western Caliphate in particular."[16] "The Jews had rapidly adopted the Arabic language as it spread over the lands of Moslim conquest. As early as the beginning of the eighth century, scarcely 50 years after the conquest, a Babylonian Jew . . . . translated a medical work from Syriac into Arabic."[17] From the latter part of

[12] Publications American Jewish Historical Society. No. 28, 1922, p. 140.

[13] Sarton Introduction, I, 683.

[14] Garrison, History of Medicine, 4th ed. Phila. and London 1929, p. 126.

[15] Campbell, Arabian Medicine, London 1926, Vol. I, p. 59.

[16] For an excellent summary of the significance of Arabic medicine and of its transmission to the European world the reader is referred to the lectures of Prof. George Sarton: The History of Science and the New Humanism." New York, 1931.

[17] Steinschneider, Arab. Literatur, Introduction.

the eighth century the Jews used Arabic for literary purposes, and the extensive literature they thus produced is an indication of the intimacy of their life with that of their Arabic environment.[17]

It must be borne in mind that "though a major part of the activity of Arabic-writing scholars consisted in the translation of Greek works and their assimilation, they did far more than that. They did not simply transmit ancient knowledge, they created a new one. To be sure none of them attained unto the highest peaks of the Greek genius . . . . that is what we call the Greek miracle. But one might speak, also, though in a different sense, of an Arabic miracle. The creation of a new civilization of international and encyclopaedic magnitude within less than two centuries is something that we can describe, but not completely explain. This movement, as opposed to the Greek, was perhaps more remarkable for its quantity than for its quality. Yet it was creative: it was the most creative movement of the Middle Ages down to the thirteenth century."[18]

It is in this great movement so far as it relates to medicine that we are interested, and here the Jews played a notable part as physicians, teachers, and medical writers. Among them, the most distinguished were Isaac Israeli (ca 850–950 C.E.), and Moses Maimonides (1135–1204 C.E.). But there were many lesser lights as the list given in Appendix B abundantly shows. It must be noted that all their medical writings were in Arabic. We know of none originally written in Hebrew. At the same time however many of the Jewish religious and philosophical works were written in Hebrew.

The Jews did their greatest service to European medicine as translators and transmitters of Arabic medicine. Campbell tells us that "Christian scholars who were under the intellectual domination of tradition and the priesthood found many of their number wending their way to Moslem Spain in order to secure translations of the Arabic works."[19] It was not only through Hebrew translations that Arabic

[18] Sarton, History of Science & the New Humanism, p. 101.

[19] Campbell, Arabian Medicine, Vol. I, p. 59. Medical activity in Muslim Spain was almost on the same level as that which obtained in the Eastern Caliphate, in some respects it was even superior. One of the most distinguished of the Spanish physicians, however, was not a Muslim, but a Jew, the great Hasdai ibn Shaprut (915–990?). He translated Dioscorides into Arabic with the aid of a Greek monk . . . . (Sarton I, 651).

literature was brought to Europe, but also through Latin translations by such Jewish scholars as Faraj ben Salim and Bonacosa. During the early period, Jewish scholars used Arabic in Spain and throughout the East. As in later times and other languages, they frequently used the Hebrew script in writing or copying Arabic texts. Many such Mss. are extant.

"In the 12th century Jewish culture began to move beyond the Pyrenees. The Jews of France and Germany knew no Arabic, and it was necessary to translate for them into Hebrew . . . ." "The Jewish translators of the second half of the 12th century had been interested only in Jewish works, but the situation was very different in the 13th century which was the Golden Age of Arabic-Hebrew translation." (Sarton)

It is interesting to learn the relative estimate of this literary output. Sarton in his discussion of the first half of the 12th century is of the opinion that none of the Arabic Jewish writers "was at all comparable to his Hebrew writing brethren. This is extremely significant, and the more so if one considers that scientific books written in Hebrew were very few. The higher scientific education of every Jew was necessarily conducted in Arabic, yet the most prominent Jews of the time were already using Hebrew preferably to other languages."[20]

The great activity of the Jews as translators into Hebrew did not begin until the 12th century. The earliest translations from Arabic into Hebrew were made in the eleventh century, but it was Judah ibn Tibbon (1120–90) who, in the second half of the twelfth century, introduced accuracy and care in this work. He was born in Granada, became a physician, and later lived in Lunel in France. He is regarded as the "Father of Translators," for he opened a new era. It was he who gave impetus to the great activity in translation in the thirteenth century. During this century most of the important Arabic works were translated into Hebrew, medical works taking their full share. Many translations, also, appeared in the fourteenth century, but this century saw the period of activity end, so that little appeared in the fifteenth and sixteenth century.[21] It is worthy of note, that the closeness of Hebrew and Arabic account for the relative excellence of

[20] Sarton, Introduction II, p. 148.

[21] Jew. Encycl. "Translations."

Hebrew translations of Arabic works over translations into other languages.

It was not only Arabic works that were translated into Hebrew, but as mentioned above, Latin writings as well. But while the Arabic-Hebrew translation began in the 11th century, the earliest Latin-Hebrew translations were made in the 13th century. The Jewish translators were all of the west.

It would be a great task to give a list of all these translators, and the works they put into Hebrew. Steinschneider has done this task on a monumental scale in his work "Die Hebraeischen Uebersetzungen des Mittelalters und die Juden als Dolmetscher, Berlin 1893.[22] In this work of 1077 pages the portion devoted to medicine covers almost 200. This is divided into four parts according to authors, Greek, Arabic Jewish, and Christian as follows:

1. Among the works of Greek authors translated into Hebrew the most important are those of: Alexander of Tralles, Dioscorides, Galen, Hippocrates.

2. Of the Arabic writers, we may mention: Ali ibn Abbas, Ammar ibn Ali (Ophthalmology), Averroes (ibn Rushd), Avicenna (ibn Sina), Ibn al-Jazzar, Al-Farabi, Hunain ibn Ishaq (Johannitius), Masawaih al-Maridini (Mesue, Senior), Masawaih al-Maridini (Mesue, Junior), Razi (Rhazes), Serapion, Abu-l Quasim al-Zahrawi, ibn Zuhr (Avenzoar).

3. The third division is that of the Jews, which includes works of: Isaac Israeli, Joshua al-Lorqui, Maimonides, Solomon ibn Yaish, Meir Alguadez.[23]

[22] "Steinschneider is of particular interest to medical men by reason of his original exposition of the translating movement in the 12th and 13th centuries as the prime factor in the Arabization of Western European medicine, his unique contributions to the history of Jewish and Arabic medicine and his innumerable scattered notations of fact which have been so helpful in the elucidation of mediaeval science and philosophy." (Garrison, Moritz Steinschneider, as a Contributor to the History and Bibliography of the Medical Literature, Libman Anniversay Volumes, International Press, New York, 1932.)

[23] Sketches will be found in Jew. Encycl. They are all mentioned in Appendix B except Alguadez who is also known as a translator; he made a collection of prescriptions in Spanish about 1400. His pupil, Joseph (Lorqui?) added more. The collection was translated into Hebrew about 1546.

CANON OF AVICENNA HEBREW MS. CODEX 2197, BIBLIOTECA UNIVERSITARIA DI BOLOGNA
(From Piero Giacosa's Magistri Salernitani nondum editi, Torino 1901, Tavola 9)

4. Of the Christian writers whose works were translated into Hebrew there are the following: Arnold of Villanova, Bernard of Gordon, Constantin the African, Gentile da Foligno, Gilbertus Anglicus, William of Salicet, Guy of Chauliac, Maurus, Nicholas of Salerno, Petrus Hispanus (later Pope John XXI), Roger of Palermo, Theophilus, Philaretus, etc.

Steinschneider points out the interesting fact observed in the foregoing notes that the number of Jewish authors who found translators into Hebrew was few, that there were four times as many Arabians and ten times as many Christian writers. The work of translation from Arabic into Hebrew was mainly done in Southern France. This is shown notably in the extensive studies of Neubauer and Renan, entitled "Les Ecrivains Juifs Francais du XIV Siecle" and published in the Histoire Litteraire de France, Vols. XXVII (1877) and XXXI (1893).[24] It is pointed out by Renan (Vol. XXVII, pp. 571–572) that "the translation from Arabic into Hebrew was the principal service rendered by the Jews in the middle ages, and was done entirely by Jews who came from Spain and retained command of Arabic during several generations." It should be noted that Jews suffering from the persecution of the Almohad Moslems fled from Spain in the middle of the 12th century and found refuge in southern France. Renan, also, states[25] that "these Hebrew translations have preserved for us many works which have been lost to us in Arabic . . . . In the Provence, Rabbinic Hebrew became exclusively the literary language of the Jews . . . . Until the end of the 14th century works of most diverse subjects in Rabbinic Hebrew continued to be written in France. This activity lessened during the first half of the 15th century and then gradually disappeared."

But it was not only Arabic literature that was translated into Hebrew. "Almost all of the works on medicine of the fourteenth and fifteenth centuries in particular those of the school of Montpellier passed from Latin into Hebrew.[26] Not only Latin but also Spanish, French, and Italian medical writings began to appear in Hebrew

[24] The earlier work on "Certain Rabbis of the 13th Century" published in the same Histoire Litteraire Vol. XVI (1824) contains no medical references.

[25] Ibid. Vol. XXVII, p. 572.

[26] Ibid. XXXI, p. 786.

translations. The first of these translators, Judah Leone Romano, says at the end of one of these translations, that he wished *to show his Jewish brethren that Christians also possess knowledge of the sciences even though they think that they have exclusive possession.*[27]

One does not have to seek reasons for the prolific activity of the Jews in translating medical works into Hebrew. It is an indication of scientific interest on the part of a large number of Jewish physicians. It is not without importance to note the following:

"Salomon b. Abraham ibn Daud, who was probably a Spaniard states that there were few works on medicine among the Jews, and one is obliged to study books. He, therefore, translated two splendid ones, —one of Averroes and the other of Avicenna."[28]

Another translator, Leon Joseph, tells us that "for ten years he sought in vain for the writings of Gerard de Solo and Maestro Juan Tornamira, even in Montpellier and Avignon after the faculty of Montpellier *had laid an anathema on those who sold these works to non-Christians.* However, in 1394, he bought them for double the price and set to work at translating them. Those who are ignorant of Latin will be grateful to him for having enabled them to dispute with Christian physicians."[29]

Nathan ha-Meati explains that because of "the contempt in which learned Christians hold the Jews because the medical works of Solomon and their later writers have been lost, he wished to follow the example of the Tibbonides who had drawn up the books from the marsh and the well of the Arabic language!"[30]

Steinschneider was convinced that one of the chief factors that led to prolific translation was not only the great desire for knowledge and the dissemination of science, "but also the national honor which required protection from the scorn of ignorance or of lack of literature."[31]

It is significant of the value placed upon the medical works in the language, that when in 1524 the possession of all Hebrew books was

[27] Steinschneider, Hebr. Uebers. p. 490. Jew. Encycl. "Romano Leone."

[28] Steinschneider, Hebr. Uebers. p. 672. Jew. Encycl. "Solomon b. Abraham ibn Daud."

[29] Ibid. p. 795. Jew. Encycl. "Leon Joseph of Carcassonne."

[30] Steinschneider, Hebr. Uebers. p. 680. Jew. Encycl. "Meati."

[31] Steinschneider, Hebr. Uebers. p. xvi.

forbidden to the new Christians or Marranos of Portugal there was one exception made; converted Jewish physicians and surgeons were allowed to keep and use their Hebrew medical works.[32]

HEBREW MEDICAL WRITERS OF THE 13TH AND 14TH CENTURIES

During the 13th and subsequent centuries there were Jewish medical writers who wrote their works in Hebrew:

Nathan b. Joel Falaquera, Spanish Jewish physician in second half of 13th century. He wrote the Zori ha-Guf, a collection of medical quotations from the great Arabic authors. It is divided into the following four parts, theory of medicine, practice including hygiene, diseases of the different parts of the body and their treatment, herbs and other drugs. In this work he uses all the medical and botanical terms he could find in the Talmud.[33]

Solomon ben Joseph ibn Ayyub[34] Granada lived in Beziers in the middle of the thirteenth century. He translated Arabic works into Hebrew, among them the Sefer ha-Arguzah, a treatise of Avicenna. He wrote a work on hemorrhoids, Ma'amar al ha-Tehorim, of which two Ms. copies are in the Library of the Jewish Theological Seminary in N. Y. They have recently been published in Ha-Ropheh ha-Ibri (a Hebrew medical magazine published in New York) with an introduction by Prof. Alexander Marx (New York 1933, p. 63).

Abraham ben Shem-Tob of Tortosa born in Marseilles middle of 13th century, son of Shem-Tob b. Isaac, also physician and translator. Abraham wrote a short treatise on hygiene in Hebrew, Hibbur Refuah be-Dereh Kazerah.[35]

Abraham ben David Caslari of Catalonia who lived in the first half of the 14th century was the author of the following medical works: (1) "Aleh Ra'anan" (Verdant Leaf), or, as it is quoted by Judah ben

[32] Kayserling, Juden in Portugal, Leipzig 1867, p. 348.

[33] Jew. Encycl. IX, p. 183, "Nathan b. Joel Falaquera." Concerning this work see Steinschneider Hebr. Uebers. 842 and article of Perreau and Steinschneider quoted there. There are three Mss. copies of this work in the Jewish Theological Seminary in New York. See, also, other four encyclopedic compilations mentioned pp. 842–843.

[34] Sarton II, 845. J. E. "Solomon b. Joseph ibn Ayyub."

[35] Sarton Introduction II, 1096 and Jew. Encycl. "Abraham b. Shem-Tob."

Natan, "Aleh ha-Refuah" (The Leaf of Healing), a treatise on fevers, divided into five books (1326). The author says that he wrote the book at the request of his friends, who wished to possess a vade mecum on these matters. (2) "Mamar be-Kaddahot ha-Debriyot u-Mine ha-Kaddahat," a treatise on pestilential and other fevers composed in 1349 when the Black Death decimated the populations of Provence, Catalonia, and Aragon. This has been published by Pinkhof together with a Dutch Translation.[36] (3) "Dine ha-Hakkazah" (Rules for Bleeding), (4) "Mekalkel Mahalah" (Who Sustains in Sickness), only an extract from which has been preserved.[37] Caslari also translated a number of books.

Solomon ibn Ya'ish ben Abraham who died at Seville in 1345; wrote on medical as well as on other sciences, but none are extant.[38]

Samuel ibn Wakar, physician, astronomer, astrologist of Alfronso XI of Castile in the fourteenth century was believed to be the author of a work "Castilian Medicine" in 1376, still extant in Ms.[39]

Moses ben Joshua of Narbonne (Maestro Vidal Balsom) was born in Peripignan at the end of the thirteenth century and died after 1362. He suffered much from the persecutions following the Black Plague. He was an enthusiastic follower of Averroes, and the author of a number of philosophical commentaries and translations. He wrote a commentary on the fourth part of Avicanna's Canon, and a treatise on medicine "Orah Hayyim."[40]

THE RENAISSANCE

There were non-Jewish scholars since the early days of St. Jerome who had some knowledge of Hebrew, but they were few and isolated.[41]

[36] H. Pinkhof, Abraham Kashlari, over Pestachtige Koortsen, Amsterdam 1891.

[37] Taken from Jewish Encycl. III, p. 599, "Abraham b. David Caslari." See also Steinschneider, in Virchow's Archiv. xl. 122; idem, Hebr. Uebers. pp. 973, 732; Renan-Neubauer, Les Ecrivains Juifs Francais, pp. 644 et seq.

[38] Steinschneider, Hebr. Uebers. p. 686. Jew. Encycl. "Solomon ibn Ya'ish."

[39] Steinschneider, Arab. Lit. p. 165. Graetz Hist. IV, p. 79. Jew. Encycl. "Ibn. Wakar."

[40] Jew. Encycl. IX, p. 71, "Moses b. Joshua of Narbonne." Three Mss. are in the Jewish Theological Seminary Library. See, also, Steinschneider Hebr. Uebers. p. 746.

[41] An excellent account will be found in the chapter: "Hebrew Scholarship in

Peter Abelard in the 12th century lamented the prevalent ignorance of Hebrew.[42]

It was Roger Bacon in the 13th century who "urged the needs of proper linguistic study laying special stress on Greek, Hebrew, Arabic and 'Chaldean.' These four languages are important . . . . because all significant texts, whether in theology, philosophy, or science are written in them. . . ." (Singer)

Richard de Bury in the same century tells us in his Philobiblon (Chapter 10): "Ignorance of the Greek tongue is a great hindrance to the study of the Latin writers . . . . and we must come to a like judgment as to . . . . Hebrew as regards the text of the Holy Bible. . . ."

Dante "set high value on Hebrew." Pope Sixtus IV (died 1484) who built the Vatican Library "employed special scribes for Hebrew as he did for other learned languages."[43]

The Humanists did not only return to Greek, but also to Hebrew, at first in order to study the Bible in the original language. Aegidius of Viterbo (1471–1532), Pico della Mirandola (1463–1494) and others, but especially Reuchlin[44] (1455–1522) encouraged the study of Hebrew in Western Europe. They gained their instruction from Hebrew scholars. Their chief interest was in the mystic literature of the Cabala.

Reuchlin wrote: "The language of the Hebrews is simple, uncorrupted, holy, terse, and vigorous; God confers in it direct with men, and men with angels without interpreters, face to face . . . . as one friend converses with another . . . . Its purpose is to prove that the wisdom of all nations, the symbols of pagan religions and the forms of their worship are but misconceptions and travesties of Hebrew truth, mysteriously concealed in the words, in the very shapes of the letters of the Hebrew tongue."[45] In the preface to his Greek and Latin ver-

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the Middle Ages" by Singer, and in the chapter following on "Hebrew Studies in the Reformation and After" by Box, Legacy of Israel, Oxford 1927.

[42] Jew. Encycl. "Abelard."

[43] Burckhardt, "The Civilization of the Renaissance in Italy," Harpers 1909, p. 206.

[44] Reuchlin's instructor in Hebrew was Jacob Loans, physician to Emperor Ferdinand III.

[45] Graetz, Vol. IV, p. 433. In this connection it is of interest to add the following note: Francis Mercurius van Helmont, the son of John Baptiste in 1667 pub-

sion of the New Testament, Erasmus wrote in 1516: "A fair knowledge of the three languages—Latin, Greek and Hebrew is of course the first thing,"[46] and elsewhere he says: "If some divinity, who is a friend of good letters regards favorably the noble and almost kingly vows of our Aldo (the great printer), and if the fates are propitious, I promise scholars that within a few years they shall have every good author in the four languages, Latin, Greek, Hebrew and Chaldee, in every branch of learning, in full and emended editions, through the efforts of this one man, and that no one shall lack any part of his literary inheritance."[47] The great increase of interest in Hebrew is reflected in Rabelais' (1495–1553) Book 2, which first appeared in 1532.[48] "Now it is, that the learned languages are to their pristine purity restored, viz. Greek (without which a man may be ashamed to account himself a scholar), Hebrew, Arabic, Chaldean, and Latin. Printing likewise is now in use, so elegant, and so correct, that better cannot be imagined, although it was found out in my time by divine inspiration, as by a diabolical suggestion on the other side, was the invention of Ordinance." (Learn languages) "and then the Hebrew, for the holy Scripture-sake." "Then faile not most carefully to peruse the books of the Greek, Arabian, and Latin Physicians, not despising the Talmudists

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lished a curious book describing the natural form of the Hebrew alphabet. (The writer possesses the 1697 Dutch translation of this work printed in Amsterdam. In July 1914 the Volta Review contained a review and reproduction of the work "The Pioneer Pictorial Presentation of Mouth Positions for use in teaching speech and lip-reading to the Deaf" by DeLand.) After years of earnest research, Francis became firmly convinced that the letters of the alphabet of the ancient Hebrew language were of divine origin, and that when God created man in His own image He may have used pictorial characters in teaching speech to the first man that bore a close resemblance to the positions which the vocal organs naturally assume when given words are correctly pronounced. . . (The book contains a set of 34 anatomical diagrams illustrative of the mechanism of speech.) This rare little "tract" also contains a frontispiece, showing the author sitting before a mirror and recording the space measured between the lips as different speech sounds are uttered. . . . Van Helmont, 247 years ago, believed that his researches would be serviceable in teaching the deaf to "learn to speak by observing the appearance of the tongue and mouth of others in speaking."

[46] Box, "Legacy of Israel," p. 318.

[47] Preserved Smith's Erasmus, Harpers, New York, 1923, p. 45.

[48] Navarre Society Edition, Vol. 1, pp. 204–205.

and Cabalists; and by frequent Anatomies get thee the perfect knowledge of the other world, called the Microcosme, which is man."

I have elsewhere called attention to the views of Mosellanus who in those days gave the following expression to this interest in his rectorial oration at the University of Leipzig in 1518: "There lies hidden in the libraries of the Jews a treasure of medical lore so great that it seems incapable of being surpassed by the books of any other language. This (treasure) no one without a knowledge of Hebrew grammar could bring forth into the light. And I am mistaken if the most reverend men and those among the Christians who are most skilled in languages do not concur in my opinion, and if the chief men, as they are all very great and very prudent, do not receive Jewish physicians unto themselves. . . . And what prevents our Christian youths of quick intelligence, who are destined for this profession, from learning this language, in a few years, or if they have a burning desire for study, in a few months, up to a point necessary for comprehending and understanding it?"[49]

A Hebrew press was established in Italy in 1475; in 1500 there were Hebrew presses in a dozen places in Italy;[50] University Chairs were founded for Hebrew in Bologna (1488) in Rome (1514) in Louvain (1517), Paris and elsewhere. The movement rapidly grew in interest and in extent, throughout the sixteenth century and manifested itself in medicine in the following publications.

As early as 1514 Laurentius Fries published a book of Synonyms of all names of medicinal plants in Hebrew, Greek, Arabic, Latin, and German languages. A second edition of this work appeared in 1535 in Strassburg. (Copy of 1514 edition in library of writer.)

Vesalius in his Fabrica in both the editions of 1543 and 1555 (at the end of Liber I), as well as in his earlier Anatomical Tables published in 1538, gives Hebrew equivalents together with Greek equivalents for some of the anatomical structures. It is noteworthy that Vesalius does not give Arabic equivalents. Hyrtl[51] informs us that Vesalius did

[49] Jewish Quarterly Review, New Ser. 1919, Vol. X, p. 22.

[50] Amram, makers of Hebrew Books in Italy, Philadelphia 1909, Chap. II. Margolis and Marx, History of the Jewish People. Philadelphia 1927, p. 480.

[51] Hyrtl, the great Vienna anatomist and scholar, published the very interesting historical study: Das Arabische und Hebraeische in der Anatomie in 1879. He found that in the pre-Vesalian literature there were but few writers who did not use

CHARACTERVM, QVI TRIBVS VNIVERSVM SCELETON EXPRIMENTIBVS FIGVris adhibentur, Index.

TRIBVS præcedentibus figuris (quas integras nuncupare soleo) ijdem ferè inscribuntur characteres. quanquã si quis illarum alicui peculiaris tantum fuerit, ex numero prompte obseruabitur, quem singulis characteribus modò in Indice subijciã, quo potissimùm institui ossiũ nomina simpliciter ascribere: primùm ea collocaturus, quibus toto sermonis contextu præcipuè utor: dein Græca, mox (si quæ alia sint) Latina probatioribus recepta autoribus, idq; ita ut ordo hic cum quandã habeat. His succedẽt Hebræa, sed & aliqua ex parte adhuc Arabica ex Hebræo Auicẽnæ interprete propemodum omnia, insignis medici mihiq; familiaris amici Lazari Hebræi de Frigeis (cum quo in Auicenna uersari soleo) opera desumpta. Atq; illis nominibus ideo Latinas literas subiungendas duxi, quòd horum pleraque in Arabum libris Latinitate donatis occurrunt: ac proinde etiã merito post hæc locũ habebunt alia in Latinis Arabum interpretibus passim obuia, simul cum ijs quæ in scholasticis (ut dici gaudẽt) doctoribus, nostræq; ætatis manualium medicorum libris leguntur, non minus sanè quàm nomina Latinis recepta autoribus sedulò expendenda. Os itaque Græcis nominatur ὀνικὸν, Latinis uerò os. Hebræis autem עצם bezem. Cartilago autem χόνδρος, חסחוסים hasechusim. Cæterùm ossium nomina opportunè auspicabimur à capitis ossibus, seu caluaria, quæ Græcis dicitur κρανίον, λέπυς, λοβὸς, καλύπτρα, σκαφίον. Calua, cerebri galea, atque ita nonnulli totam capitis ossium sedem uocant cerebrum amplexantem, octoq; ossibus efformatam. aliqui uerò eam duntaxat, quæ crinibus ornatur. cuius circulus κορυφὴ & κεφαλὴ nuncupatur. חק הגבוה theck hamoab, קדקד הגבוה chederath hamoach. theca & olla capitis, testa capitis, & scutella capitis, asoan.

Suturæ, quibus capitis ossa inuicem committuntur, generatim uocantur ῥαφαὶ, שלבים scelauim. senan, direzan, adoren, complosa.

A 2,3 Sutura coronalis, στεφανιαία. חבלולי bachlilij, משחרי chasethij. arcualis, sutura puppis.

B 2,3 Græcorũ maiusculum Λ referẽs sutura, λαμβδοειδὴς, & υ ab similitudine ὑπσιλοειδὴς. לבדיי lambdij. laude, hypsili, sutura proræ.

C 3 Sagittalis sutura, ὀβελιαία, ῥαβδοειδὴς. Instar teli, ueru, aut uirgæ secũdum capitis longitudinem prorepens sutura. חציי checij, משחרי scesodij. nerualis, idq; potissimùm ubi hæc coronali committitur: qui locus etiam zeudech, idq; imprimis Mesuæ uocatur.

D 2,3 Hæc compago ueræ suturæ imaginem non exprimens cum sua cõiuge uocatur, suturæ squamarum modo inuicem cõmissæ, λεπιδοειδὴς κροτάφιαι, temporales, squamæ formes. קלפים chelaphijm. corticales, mendosæ. Reliquæ autem caluariæ suturæ proprijs destituuntur nominibus. cuiusmodi uerò illæ sint, non est quòd hic prolixius denuò repetam.

α 2,3 Hoc os unà cum suo coniuge, uerticis ossa uocatur, itemq; βρεγματικὰ, κορυφαῖα. sunt quibus syncipitis ossa nuncupantur. עצם הקדקד bezem hachodchod. nerualia, paria, arcualia: quanquã alij ita iugalia nuncupent ossa. parietalia, quo nomine nonnullis temporum ossa dicuntur. ossa rationis, seu cogitationis.

β 1,2,3 Frontis os, μετώπου, quibusdam sincipitis. עצם המצח bezem hamezzech, coronale, os puppis capitis, os inuerecundum, os sensus communis.

γ 2,3 Occipitis seu occipitij os, ἰνίου. עצם העורף bezem haoreph. laude os, pyxis os, os proræ, os memoriæ. Sunt qui & basillare (quòd magnam capitis portionem cõstituat) nuncupent, etiamsi id nomen cuneiformi ossi priuatim inditum fuerit.

δ 2,3 Id os cum suo pari, temporum ossa, κροτάφων, κροτάφοις, κοχλίᾳ λιθοειδεῖ. aliqui etiam λιθοειδὲς, lapidea, lapidosa. חרקים hazedabim, עצמות האבנים hazzamoth haaunijm. auriũ: etiamsi id nomẽ duobus ossiculis accommodari possit auditus organi constructionem ingredientibus, & in scamno cui secunda figura cubitis innititur, q; & * expressis. Quandoquidem q; ossiculum notat incudi aut molari denti assimilatum, * uerò id quod malleolo aut femoris ossi comparamus. Quum itaq; ea ossicula priscis Anatomes professoribus fuerint incognita, non mirum est illa etiã nominibus destitui. Cæterũ temporũ ossa quibusdam tymparũ, mendosa, parietalia, dura, armalia dicũtur.

ꝙ 2 In temporis osse processus styli acui ue ꝭ imaginem referens, σκολοειδὲς, γραφοειδὲς, βελονοειδὲς, πλάκτρῳ. calcar capitis. חוחי בחמר chemo marhezz. os calaminum, sagittale, clauale, acuale.

ζ 1,2,3

ζ 1,2,3 *Temporis ossis processus, uberis papillã referẽs,* μαστοειδὴς, *mamillaris,* עמד מכוברי *bezẽ potmij.*
E 2,3 *Os cuneo comparatum,* σφηνοειδὲς, *Galeno* ἐφ' ἡμῶν ὑπερῴου ὀστοῦν *(etiam si palatum uix contingat) circũscribitur,* πολύμορφον. *Cuneiforme palati os, basillare, quanuis sic etiam appellent occipitis os,* מושב חבוזה *moscau hamoach. Baxillare, paxillum; os colatorij, os cribratum, cauilla: quam quam & ita talum quoque uocent.* 2 *Sedes caluariæ, quam lapidosam dicimus.*
θ 2 *Cuneiformis ossis processus, uespertilionũ alis assimilati.* πτερυγοειδὲς, עמד כנפי *bezẽ chenaphij.*
F 1,2,3 *Hæc sedes simul cum sua coniuge in altero latere, uocatur ossa iugalia.* ζυγωματα, ζυγοειδῆ, ζυγώδη. עצמות חוגג *hazamoth hazogh. Ossa paris, paria, quæ nomina illis etiam temporũ assẽbũtur ossibus, ansæ ossium temporum, arcualia ossa.*

Superioris maxillæ duodecim ossibus nullum inscripsimus characterem, quòd priuatis destituantur nominibus, quanquam interim septum narium, nonnullis cristæ os nuncupetur. Cæterum superior maxilla dicitur γνάθος, *mandibula.* חלחי חחלילין *balechẽ haheliot. quæ nomina & inferiori maxillæ*
G. *G in trib. figuris notatæ accõmodãtur, quã Halyabatis interpres priuatim Faucẽ uocat. Dentes,* ὀδόντες, שניים *scinaijm, plurimum in utraque maxilla sedecim figuntur, quorum quatuor medij, anteriores q́, incisorij uocãtur.* τομεῖς, ἀκτῖνες, κύνες, γνλαφοὶ. *risorij, quaterij.* תחוחבים *ha mechatechim quadrupli. Verũ duo medij, priuatim duales illis appellãtur. Qui utring; incisorijs proximus est, caninus uocatur, sũtq́ ita utriusq́ maxillæ duo canini.* Lωδόντες. בלבים או בוהלעיה *chelauijm aut metaleboth. mordentes, hos quidã quoq́ risorios uocauerunt. Quinq́ autem utrinque insequẽtes, molares appellantur.* μυλίτης, γόμφοι. *molares, maxillares, paxillares, Cicero Geuinos, quo nomine alij eos appellant, qui post pubertatem ferè crescunt, ac Græcis* σωφρονιστῆρες, ἐμφυτῆρες, ἐπίγνιοι *uocantur: nostris dentes sensus ac sapientiæ, dein cayseles.* גנחיר *naghuid. neguegidi, nanged, albalm. Molares uerò, Hebræis dicuntur* טוחנות *tochanob.*
H 2 *Os* υ *referens.* ὑοειδὲς, ὑπσιλοειδὲς, λαμβδοειδὲς, πτερυγοειδὲς, φαρύγγιον. *os* υ *aut* Λ *imaginem exprimens.* עצם לאבר או לגרוי *bezem lhami aut lamdij. Linguæ os, gutturis os, os laude, os morsus Adam. Auicennæ Interpres Capite de Gutture habet: Alsuic os habẽs quatuor latera, duo inferiùs, duo superiùs, quod non obiter Anatomes studioso obseruandum uenit.*
I, K, L, M, & N *His characteribus, in tribus figuris ferè conspicuis dorsum notatur, quod* ῥαχὶς, ἄκανθα, νῶτον, *spina, tergũ, hominis carina,* שדרה *scidra nuncupatũ, multis extruitur uertebris,* σπόνδυλοι, חוליות *chulioth. Verticulis, ossibus fusi, quæ in posteriori sede acutũ educũt processum, qui* ἄκανθα, *Siminea, ad senatem sensum uocatur. Cæterum ab I ad K indicatur ceruix.* τράχηλος, αὐχὴν, *collum.* צואר או גרון *zauor uel gharron. Tenon athlas, quod nomen alij septimæ ceruicis uertebræ duntaxat tribuunt. Porrò à K ad L uertebræ insigniuntur thoracis,* θώραξ, *aliquando & νῶτον, μεταφρένον. pectoris, interdum dorsi simpliciter.* חזה *chaze. interscapilij. Ab L ad M uertebræ lumborum.* ὀσφύς, ψόας. *renum.* בוהנים *mothnaim. alchatin. Ab M ad N os sacrũ proponitur.* ἰσχίον, πλατύ. *latum,* עצם חכבשה *bezen pi hatababath. lumbare, ossa cluniũ, clauiũ, alagar, agit, abbans, abbaũ, uetula, osamiũ, osanũ, quæ nomina coccygi ossi ab alijs assẽbũtur. N inscribitur coccyx os.* κόκκυξ, ἀκανθοειδὲς, ἰξυοειδὲς. עצה *haze. caudæ os, albosos, dein reliqua, quæ ossi sacro ex quorundam interpretum sententia tribuimus nomina.*
O 1,2, 3 *Pectoris os.* στέρνον. *quo nomine nonnulli superiorem ossis partem appellant, inferiorem tunc* θώραξ *nuncupantes* עצם החזה *bezem hebace. thorax, asser, cossos, scutum cordis.*
P 1,2,3 *Mucronata pectoris cartilago, ensi cõparata.* ξιφοειδὲς, ensiformis. עצם כרלי יחצ *bezẽ bedelij rachauch.* גיחוני *gheroni,* אלחנגרי *alchangri, quibus nominibus uniuersum pectoris os donatur. Malũ granatũ ensifoidis, cultralis, epiglottalis cartilago, scutũ, clypeus oris stomachi, medium furculæ inferioris.* 1,2,3, *& cæt. usque ad 12. In tribus figuris duodecim thoracis costæ tam ueræ ac legitimæ, quàm notheæ spuriæque indicantur.* πλευραὶ. זלעות *zelaboth.*
Q 1,2, 3 *Clauiculæ.* κλεῖδες. *claues, iugula, sunt qui & has humeros appellarunt.* כתפ *scechẽ. Furculæ, aut priuatim furculæ inferiores, quas ab humiliori pectoris ossis sede, ita distinguunt.*
R 1,2, 3 *Scapula.* ὦμος, ὠμοπλάτη, πλάτη. *Scapula, Latinis plerunque etiam humerus nuncupatur, scoptulum opertum, scoptula.* כתף *chatheph. Spatula, clypeus & scutum pectoris. Cæterum*
λ. *λ in tribus figuris, superior scapulæ insignitur processus, quem summum humerum ferè uocamus,* ἀκρώμιον, *aliquãdo aũt Hippocrati & ἀκρωμιώνιον. Galeno etiã* πρακρανίς *dictus.* אגרסו חרטום *agrasso chartom,* פי חשורב *pi haboreub. Rostrum porcinum, caput ascapulæ. alacharum, man-*
μ. *char, algorab, destructũ. Processus autem scapulæ interior inferior'ue, in prima figura μ indica-*
tus

not know Hebrew, but that the formation was furnished him by a learned Jewish friend, Lazaro de Frigeus of Venice.[52] The Hebrew anatomical terms which he used are for the most part taken from the Hebrew Canon of Avicenna. Other works likewise followed Vesalius, thus Thurneysser in his "Historia und Beschreibung" of the action of all plants, etc. . . . . , published in Berlin in 1578, gives the Hebrew equivalent of most of the medicinal plants. (Copy in library of writer.)

Still another book which evidently owed its publication to this interest is the Aphorisms of Hippocrates, published by Marcus Ant. Gaiotius in 1647 in Rome in which the Aphorisms are arranged in three columns—Latin, Greek and Hebrew.[53] (Copy in library of writer.)

It is only because of the rarity of this group of publications that the following of Zahrawi is added: Liber Altasriph, Autore Alzahara, alias Alzaravi, in Linguam Hebraicam; translatus per Meshullam Ben Jonah printed with Latin translation, as part of Channing's Rhazes de Variolis et Morbillis, London 1766.[54] (Copy in library of writer.)

HEBREW MEDICAL MSS.

Most of the Hebrew Mss. that are extant have been found in Italy. The oldest are of the 10th and 11th centuries.[55] Steinschneider tells us that it was in Spain and Portugal where there was the greatest number, but many have been lost for it appears that "it was easier to burn the books, if possible with those who possessed them, than to read them with understanding."[56]

Arabic terms most freely, and not only Arabic, but also a large number of Hebrew terms. As noted above, Vesalius included many of these Hebrew terms in his Anatomies; but his preference for Greek terms led to the almost complete extinction of all Arabic and Hebrew terminology in Anatomy. Hyrtl finds but a few terms like Pomum Adami, Cauda Equini, as the vestiges of a once abundant nomenclature.

[52] See Roth's Vesalius, p. 119.

[53] Hippocratis Coi . . . . Sententiae Definitivae Graece, Latine, Hebraice.

[54] Steinschneider, Hebr. Uebers. p. 740, under Zahrawi.

[55] Juedisches Lexikon, Berlin, 1928, "Handschriften."

[56] Vorlesungen über die Kunde hebraeischer Handschriften, Beiheft zum Centralblatt fuer Bibliotekwesen 1897, p. 69.

It is not possible to state definitely the number of Hebrew Mss. extant. Joseph Jacobs gave a list in the Jewish Encyclopedia in 1904 (article "Manuscripts") of those libraries whose catalogues had been published.

The English libraries contained		6824
The Bodleian (in 1886)	2541	
The E. N. Adler collection	1476	
The British Museum	1196	
Libraries in France and Switzerland		2289
The Bibliothèque Nationale, Paris	1313	
Libraries in Russia		1180
Libraries in Germany and Austria-Hungary		1604
Libraries in Italy		2972
Libraries in Spain and Portugal		144
Libraries in Holland and Scandinavia		208
Libraries in the United States		985
Making the total of		9404

But even at the time it was noted that there have been "notable additions" made to the collections of some libraries since these catalogues were published, and that many private and some public libraries could not be included. The collection of Mr. E. N. Adler has come into the possession of the Jewish Theological Seminary Library of New York.

In reviewing the Neubauer Catalogue of Hebrew Mss. in Oxford (1886) which number 2541 as indicated above, we find those on medicine under the numbers 2083 to 2149 inclusive. Many of the codices are made up of a number of separate treatises. The total number of works and tracts appears to be 75 or 3 per cent of the entire collection. Neubauer's second catalogue of 1906 adds four more codices.

According to recent information, the present Library of the Jewish Theological Seminary in New York has a rich collection of medical Mss. including both the Hebrew and those in Arabic, but written in Hebrew characters, together with the medical fragments, their number is now about 100. It is to be hoped that the learned librarian, Professor Alexander Marx, will soon be enabled to publish a catalogue.

PRINTED HEBREW MEDICAL WORKS

It is not necessary to expatiate upon the esteem in which mediaeval physicians regarded the Canon of Avicenna, the "Prince of Physi-

cians," that this work took the first place, and held it for centuries is well known. Nothing can indicate it better than the fact that the Latin edition appeared in print as early as 1473 in Milan; in 1476 and 1497 in Padua; 1482–86–90–91–94 and 1500, and seven additional editions appeared in the first quarter of the sixteenth century. Among Jewish physicians, it likewise was the work most highly prized, above Hippocrates, Galen and all others. This work was translated into Hebrew, as was mentioned above, by several Jewish scholars. No Hebrew translation[57] was known before 1279, when the first translation of the whole, by Nathan ha-Meati was made in Rome. This was one hundred years later than the first Latin translation. Zerahiah b. Isaac B. Shealtiel (Hen) Gracian[58] of Barcelona, also, made a translation in Rome. Only Book I and II are extant. Joseph al-Lorqui[59] translated Books I and II, (Part I) before 1402 and worked with Meati's original translation. Various parts of the Canon in Hebrew were, also, translated by others; thus, a translation of part was made by Amatus Lusitanus, but it was lost. The entire work was printed in Naples in 1491.[60] The Canon is the only medical or scientific incunabulum to appear in Hebrew though the number of other Hebrew incunabula printed exceeds one hundred, and of all it was the most bulky. (Complete copies of the Hebrew Canon are found in the Library of Congress, Washington, and in the Library of the Jewish Theological Seminary. An incomplete copy is in possession of the writer.)

The humanistic impulse apparently did not stimulate the Jewish physicians to publish medical works in Hebrew. Not one of the important Hebrew medical Mss. of Isaac Israeli or of Maimonides was put upon the press in the early centuries of printing. This, in spite of the fact that many Hebrew works on philosophy and religion were printed before 1500 and later. It would almost appear as though the Renaissance was followed by a long period of inactivity in Hebrew medical writing. But all activity did not cease as such works as the following prove:

a. In 1510 Valescus de Taranta's book on the plague was published

[57] Canon of Avicenna—Steinschneider's Uebers. p. 677, Jew. Encycl. II, p. 350.
[58] Jew. Encycl. "Gracian, Zerahiah."
[59] Jew. Encycl. "Ibn Vives al-Lorqui, (Joseph b. Joshua)."
[60] Printed by Azriel Guenzenhaeuser.

in Constantinople under the title *Hanehagath Hadever*. It is ascribed by the translator to Philonius, but Steinschneider has shown that this is erroneous, and that the author was Valescus de Taranta who was a Portuguese, and who in 1418 completed his medical writing "Practica" in Montpellier, the translator is not known.[61]

b. Abraham ibn Nahmias, born in Lisbon, lived in Constantinople about 1530, was author of *Sifre Refu'ah*, two of which, on the method of treating hematemesis, and on the use of cold waters in fevers, were translated from Hebrew into Latin and published in Venice in 1591 and 1604.[62] (Copy of Venice edition of 1591 in library of writer.)

c. The Sepher ha-Nimza which appeared in 1595. It is described by Steinschneider[63] as a medical compendium, gathered from various works. It was falsely attributed to Maimonides. It was reprinted in 1851.

d. We must wait almost a century for the next book. In 1683, Jacob ben Isaac Zahalon (1630–1693) of Rome published his Ozar ha-Hayyim (Treasury of Life)[64] an encyclopedic work. Zahalon, born in Rome, took his degree of doctor, artium ac medicinae, in that city. (Copy in library of writer.)

e. In 1700 Abraham ben Isaac Wallich's *Sepher Refu'ot* or *Harmonia Wallichis Medica* was published posthumously in Frankfort on the Main. Wallich, a member of a family in which there were many physicians, had taken his M.D. degree in Padua in 1655. In this booklet he endeavored to show that the diseases of the spirit correspond with those of the body and require similar treatment. He writes alternately as a physician and as a preacher.[65] To a physician he makes the impression of being better as a preacher. Part of the booklet is taken from Zahalon's work noted above. (Copy in library of writer.)

f. Tobias Cohn (1652–1729) whose father and grandfather were

[61] Steinschneider Hebr. Uebers. p. 819.

[62] Jew. Encycl. IX, p. 145, "Abraham ibn Nahmias."

[63] Cat. Bodl. page 1934.

[64] Jacob Zahalon by the writer, Bull. Med. Library Asso. July 1918, J. E. "Zahalon, Jacob b. Isaac."

[65] Steinschneider, Hebr. Uebers. pp. 704 & 959. Jew. Encycl. "Wallich." See article on Wallich family in Monatschrift fuer Geschichte Wissenschaft des Judenthums, 1905.

likewise physicians, studied medicine at Frankfort-on-the-Oder and Padua at which latter university he obtained the degree of M.D. He practised in Poland and later became physician to five successive sultans in Constantinople. He published his *Maaseh Tobiyyah* in Venice in 1707. It has undergone many subsequent editions. The work is encyclopedic and is divided into eight parts: (1) Theology, (2) Anatomy, (3) Medicine, (4) Hygiene, (5) Syphilitic Maladies, (6) Botany, (7) Cosmography, and (8) Essay on the Four Elements. The most important is the third part, which contains an illustration showing a human body and a house, side by side, and comparing the members of the former to the parts of the latter. . . . Between parts (6) and (7) there is a Turkish-Latin-Spanish dictionary. . . . Cohn gave the first description of the "plica polonica."[66] (Copy in library of writer.)

The explanation of the dearth of Hebrew medical publications during this period lies in the fact that the Jewish medical writers of whom a number were very prominent published their works in Latin, then the universal language of science in Europe.

The following are Hebrew works which have appeared later. They are all devoted to popular medicine; it is only in the last few years that truly scientific works have again appeared as the result of the present renaissance of Hebrew.

Benjamin Schwartz, *Rephuot HaGuph*, Dantzig 1771.
Baruch b. Jacob (Sklover), *Derek Yesharah*, The Hague 1779.[67]
Abraham Nanzig, *Aleh Truphah*, London 1785.
Anonymous, *Sepher Habrith*, Prague 1799.
Moses Mahl, *Sepher Giddul Bonim*, Lemberg 1821 (Hebrew and Yiddish).
Politzky, *Sepher Marpe l'Am* (translated from the German by Eliasberg), Wilna 1834.
Tissot's *Sepher Rephuot ho'Am* (Hygiene—translated by Satanov (?) with additions by Studenski, Lemberg 1851.
Studenski, *Rophe ha-Yeladim*, Warsaw 1847 (Hebrew with Yiddish translation), and 1876 (Hebrew only).
Gordon, *Sepher Darche ha-Rephuah*, Lyk 1870.
Studenski, *Orhoth Hayim* (Hygiene), Warsaw 1871.
Rabbi Samuel Shar Arye, *Sepher Refuoth*, Lemberg 1882.

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[66] Jew. Encycl. IV, p. 161, "Cohn, Tobias."

[67] Booklet on Hygiene at Library of Congress. All of the others in this list are in the library of the writer.

Sepher Shmirath ha-Briuth (Medical selections), Warsaw 1884.
Schmid, *Sepher Ho-Ain* (translated by Hamburg), Odessa 1886.
Spiro, *Nessiwoth Chaim* (translated from German of Reclam), Warsaw 1887.
Katzenelsson, *Remah Eivorim* (Osteology of the Talmudists), St. Petersburg, 1888.
Minz-ha-Calcalah ve-Kilkulah, Warsaw 1890.
Frankel, *Shomer Habriuth* (Hygiene), Warsaw 1892.
Brainin, *Sepher Orah l'Hayim*, Wilna 1893.

Modern Scientific Works

Feigenbaum, *Hoayin* (textbook on the Eye and its diseases), Jerusalem 1927.
Katzenelsohn, *Ha-Talmud ve-Hochmath ha-Rephuah* (Talmud and Medicine), Berlin 1928.
Katz, *Hush ha-Retet*, "Sense of Vibration," Hebrew University Publication, Jerusalem 1923.
Malchi, *Thesaurus Medicus Hebraicus*, Jerusalem 1928.
Perlman, *Midrash ha-Rephuah* (Medicine of the Talmud), Telaviv (1926–1929).

There are two medical journals appearing in Hebrew:

Harefuah, published monthly by the Palestine Jewish Medical Association (The first number appeared in 1920, the present series was begun in 1924) and it is now in its seventh volume.
Ha-Ropheh ho-Ivri (The Hebrew Physician), New York edited by Einhorn and Goldenstein (First number appeared 1927).

Bulletins of the Jewish Medical Society of Jaffa 1912–1913.
Report of first Trachoma Conference of Jewish Physicians of Palestine (Published by Nathan Straus Foundation), Jerusalem 1915.
In addition a number of short monographs have appeared in recent years, Masie (Cerebrospinal Meningitis 1910), Beham, (On War & Disease 1915) Zazkes (Child Care 1925), Norman (Sex Physiology & Disease 1927).

In the foregoing account, we have briefly sketched a millenium of medical writings in the Hebrew language. During the period when Arabic became the almost universal language of science and later when Latin acquired this position, Jewish physicians generally used these languages for their medical writings. Later, too, when the use of the vernacular gradually replaced Latin in the various countries, the Jews too employed these languages. But in the pre-Arabic period, Hebrew was used as the literary medium as is shown by the Mss. of Asaph and Donnolo; with the growing need of Arabic literature by Jewish students and physicians unfamiliar with the language, these works were

translated into Hebrew, and under like conditions the same was done later in the case of Latin medical literature.

The stream of medical writing in the Hebrew language was at times very feeble, but it has at no time ceased, and now at the end of a millenium, it gives evidence of fresh vigor and renewed promise.

APPENDIX A

Description of Donnolo Ms.

Manuscript on vellum, containing several medical tracts written in Hebrew by two German Rabbis at the end of the fourteenth or beginning of the fifteenth century. Cursive letters. 2 columns. Elaborately rubricated and partly ornamented with scroll work and animals in red pen-drawing. 128 leaves. Small folio. Old vellum.

Doctor Alexander Marx has examined the Ms. The following is taken from his notes. He intends to publish a full description later.

1. Prescriptions, one by Solomon of Tivoli, one by Gerardo della Marquesi of Ferrara, given for one Benjamin. Note: concerning source of a drug.
2c. Extracts from Pirke Rabbenu ha-Kadosh.
3c. Extracts from Zahrawi.
4–10. Asaph, Medicina pauperum. (See Steinschneider, Hebraeisch Bibliograph XIX, 68f; Venetianer, pp. 168–188.)
10–11. On influence of the moon (and planets) on sickness.
12–14. Prescriptions, one by R. Hillel, (probably Hillel b. Samuel, see Appendix C).
14b-15a. A chapter from the Pseudo Aristotelian Secretum Secretorem, (ed. Gaster, Ch. XII, p. 27–30).
16–21. Asaph on qualities of water, (H.B.lc. p. 66) milk, (ib. 65), meat, etc. (ib. 66/67).
21d. Enumeration of drugs and their qualities.
22–23. Prescriptions, one by R. Hillel, extract from Serapion.
24c-26b. Urology from Asaph (H. B. lc, p. 106).
26b-28a. On the pulse, (not Asaph; quotes Hippocrates and Galen).
28a-35d. Tabulae Salernitanae (i.e. Regimen sanitatis).
35d-46a. Galen on the periods of illnesses (like Ms. Florence,[68] Heb. Bibl. XXI, 83, but without division into 11 chapters and with a longer introduction, giving name of translator Abraham ben Isaac ha-Sefardi of Dania, called ben Leb. The Paris Mss. 1181–12 mention Abraham ben Shemtob Bibago as author. Hebr. Uebers. 657 nr. 15. The table of 188 sicknesses is followed by one of the one hundred and three drugs and their qualities not found in Ms. Florence.

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[68] This is the codex described by Steinschneider containing the Donnolo Ms. (see below).

46b-48b. On urine. Discusses nineteen different colors. Colophonas in Ms. de Rossi, Hebr. Uebers. 793. Here the name of the translator into Hebrew, Joab, is mentioned.
50c-73c. "Antidotario," like Ms. Florence, Catalogue Biscioni 1757, 8vo., p. 507.
73c.-75c. On fever, quoting Galen and Alexander.
75c-78d. Sabbatai Donnolo, Sefer ha-Yakar, ed. Steinschneider.[69]
73d-79d. "Simplicia Medicinae."
79d-80b. Asaph (Hebr. Bibliogr. F, 1.c. 64, Ms. München, fol. 9).
81–82. Prescriptions.
82c-124. Ibn al-Jazzar, Viaticum parts 1 and VI, agrees with Ms. Florence, but is not ibn Tibbon's translation, but probably that of Abraham ben Isaac. The titel is "Viatico" and "Zedah le-orhim." (Steinschneider, Hebr. Uebers., p. 705).
124d-126b. "Sefer ha Opiate" in 33 paragraphs.
126b. "Lapidario."

APPENDIX B

The following list of Jewish medical writers in Arabic has been compiled chiefly from the works of: Sarton's, Introduction to the History of Science, Steinschneider, "Die Arabische Literatur der Juden (Frankfurt a/M 1902), Wuestenfeld, Geschichte der Arab. Aertze, 1902, the compilation of Arabic-Jewish physicians by Loeb in the Berliner Magazin fuer die Wissenschaft der Judenthums 1880, Vol. 7, p. 100, the Jewish Encyclopedia, and Le Clerc "Medecine Arabe," Paris 1876 from which works the references are taken.

Masarjawai in the latter half of the seventh century was not only one of the earliest translators, but also wrote a tract on Nutrition, and another on Medicinal Plants, their uses, and their injurious effects.[70]

Ali al-Tabari (Abul Hassan Ali ibn Sahl (ibn) Rabban al-Tabari, convert to Islam, court physician to caliphs between 833 and 861, son of Jayl al-Tabari, (a Persian Jewish physician and astronomer, and first translator of Almagest into Arabic[71]). Ali is best known as teacher of Rhazes and author of "Paradise of Wisdom," a work in general medicine. He is frequently cited by Rhazes in ophthalmological matters.[72]

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[69] Steinschneider, "Donnolo, Fragment des altesten medicinischen Werkes in Hebraischer Sprache." Berlin, 1867. Also Virchow's Archiv. Vols. 37, 38, 39 & 42.

[70] Steinschneider, p. 13. THE FOLLOWING ABBREVIATED FOOTNOTES REFER TO THE WORKS MENTIONED IN THE FIRST PARAGRAPH OF APPENDIX B.

[71] Sarton I, p. 565.

[72] Sarton I, p. 574. Wuestenfeld § 54–55. Leclerc I, p. 290, Steinschneider, Virchow Archiv. Vol. 39, p. 312. Hirschberg, Geschichte des Arab. Augenaerzte. Greafe-Saemisch Handbuch XIII, p. 95, Diepgen, Geschichte der Medizin,

Isaac Israeli (Isaac b. Salomon), born in Egypt before 850, died in Kairwan as centenarian, physician to caliphs, wrote medico-pilosophical works on the elements and on definitions. His medical works were the greatest contributions of any of the Jewish Arabian physicians, they are:

1. Book on Foods and Simple Remedies, (Sprengel speaks of it as the best of the Arabian works on diet. Edition of 1823, p. 442).
2. Book on Urine. ("There is strong probability that most of (Mediaeval urological tradition) reached Latin Christendom only indirectly through the Arabic elaboration" by Isaac. (Sarton, Introd. II, p. 75)).
3. Book on Fever ("The best account of the subject available in Europe during the entire middle ages," Singer, Short History of Medicine 1928). These works "exercised no little influence upon the Medicine of the Middle Ages" (Campbell, Arabian Medicine, I, p. 74[73]).
4. Book of Preparatory Instruction for the Physician, known only in a single copy which is in Hebrew.[74]

Hasdai ibn Shaprut (915–990) of Cordova, translated Dioscorides from Greek into Arabic with assistance of a Greek monk. He is credited with having discovered a panacea. Wrote Hebrew letter to King of Khazars.[75]

Moses ben Elasar, latter part of the tenth century, Court physician to the Caliph, compiled a book on "Special Remedies" (quoted in the Hebrew Zahrawi and elsewhere).[76]

Abu al-Walid Merwan ibn Janah of Cordova was a distinguished Hebrew philologist and physician in the first half of the eleventh century. Wuestenfeld credits him with a work on "Simple Remedies" and on "Medical Weights and Measures."[77]

Ephraim b. al-Zafan, physician to the Caliph in Egypt in the 11th century renowned as a bibliophile and collector. He wrote a work on his medical observa-

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Mittelalter, p. 16; Steinschneider identifies him with Abu Othman Sahl, see Steinschneider, p. 23.

[73] It is of interest to note that Constantine, the African, translated these works and thus presented them to European physicians. "This Constantine, born a Muslim or perhaps a Jew in North Africa, came to Salerno in South Italy about 1090, and was there converted to Christianity. He was the first who occupied himself in Italy with translation from the Arabic. The works he thus translated were largely of Jewish origin." (From Legacy of Israel, p. 208.)

[74] Wustenfeld, § 51–52; Steinschneider, p. 38; Sarton I, p. 639; Jewish Encycl. art. Israeli; Leclerc I, 409; Friedenwald Annals of Medical History, New Series Vol. 1, p. 629.

[75] Steinschneider p. 115, Sarton I, p. 680, Jew. Ency. art. Hasdai.

[76] Steinschneider, p. 96. Not in Jew. ency.

[77] Wuestenfeld, §150, Steinschneider, p. 124, Sarton I, p. 736. Jew. Ency. art. (medical writings not mentioned) Leclerc I, p. 554.

tions, and a second on hygienic notes, and a third concerning the effects of season on the production of the humors.[78]

Isaac ibn Beklarish living at court of Sultan of Saragossa (1085–1109), about 1126 wrote a tract on "Simple Remedies."[79]

Salama ibn Rahmun, physician and philosopher in Egypt beginning of 12th century "an encyclopedist whose interest in medicine was but one of many others."[80]

Maimonides (Moses ben Maimon) born in Cordova in 1135, fled in 1148 before the Almohades to Fez, Palestine, and finally settled in Cairo (Fustat) in 1165 where he became renowned as philosopher and physician.[81] He became physician to Saladin and his son, and head of the Jewish community of Egypt; died in 1204 and was buried in Tiberias. "Maimonides' influence was tremendous and far-reaching in space and time. His medical writings have deeply influenced not only Muslim and Jewish, but also Christian doctors." (Sarton II, pp. 371, 375) and were translated into Hebrew and Latin. They comprise the following works: Aphorisms, Compendium of Galen, Commentary on Hippocratic Aphorisms, On Hygiene and Diet (addressed to son of Saladin) discourse on accidents, on poisons, on asthma, on hemorrhoids, on sexual intercourse. To these must be added the "Explanation of the Names of Drugs" a work referred to by Ibn Abi Usaibia, but otherwise unknown until recently discovered in Constantinople by Dr. Max Meyerhof of Cairo and which he hopes soon to publish. (Personal communication.)[82]

Abraham ben Moses Maimonides (1187–1237) followed his father in the practice of medicine as the latter had done. He, also, became court physician and head (nazid) of the Jewish community of Egypt. In his work "The High Ways to Perfection" there are a number of medical references.[83]

Joseph ben Ahmed ibn Hasdai, a convert to Islam of Spanish-Jewish family became a distinguished physician in Egypt in the 12th century. His medical writings were commentaries on Hippocratic and Galenic writings.[84]

Ibn Jami, Hibbat Allah, ibn Zain ibn al-Hasan, al-Israili, physician in the second half of the 12th century in Egypt and court physician to Saladin; he was a convert to Islam. He wrote on the following subjects: On the care of body and soul; On the Canon of Avicenna; On the condition of Alexandria and of its inhabi-

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[78] Steinschneider p. 175.

[79] Wuestenfeld §155. Steinschneider p. 486.

[80] Sarton II, p. 134, 190. Steinschneider p. 176.

[81] "As the greatest philosopher of Islam in those days was also its greatest physician, even so with the Jews." (Sarton II, p. 306.)

[82] Steinschneider 137, Sarton II 369, Jew. Ency. An extensive bibliography will be found in Sarton's work.

[83] Steinschneider, p. 221, Sarton p. 376. Samuel Rosenblatt, "The Highways of Perfection," Columbia Press, New York 1927.

[84] Wuestenfeld § 154, p. 88. Sarton p. 230, Steinschneider p. 148. Jew. Ency. "Joseph b. Ahmed ibn Hasdai."

tants; what to do when no physician is to be found. (First Aid?); on lemon and its use; on rhubarb and its use; on hunchback; cure of colic; Glosses on a compenddium of Canon of Avicenna.[85]

Hibatallah ibn Malka, physician and astronomer to Caliph (1160–1170) in Bagdad, where he died ca 1175, aged 80 after conversion to Islam. He wrote a summary of anatomy and several tracts on medicinal remedies.[86]

Sheshet b. Isaac ben Joseph Benvenute ha-Nasi, born probably in Narbonne died in Saragova ca 1209. He wrote a gynaecological treatise translated into Hebrew by al-Harizi.[87]

Abu-l-Maali ibn Hibatallah, Al-Yahudi, Egyptian Jewish physician to Saladin (1169–1193) and later to Al-Adil (1199–1218). His children became Muslims. He wrote Medical Glosses and Experiences; probably identical with Maimonides' brother-in-law who died 1222 (husband of Maimonides' sister and brother of Maimonides' wife). If so, it was his son Yusuf ibn Abdallah who edited in 1204–5 the last chapter of Maimonides' Aphorisms.[88]

Samuel ibn Abbas died in Musul in 1163, was physician and mathematician. He embraced Islam. Among his writings one is on gynecology. The famous Epistola Samuelis Marocani is based upon his writings.[89]

Ibn al-Mudawwar, Egyptian Karaite, died 1185, aged 83. Physician to Fatamid and Saladin; he published a collection of observations. A pharmacopea attributed to him is probably the work of David b. Solomon (see below).[90]

Ibn al Nagid of Cairo, died 1189 wrote a collection of medical observations.[91]

Judah b. Solomon al-Harizi, born in Spain, philosopher, poet and physician, travelled extensively between 1190–1230. He is chiefly known by his translations, but, also, wrote an original poem on diet.[92]

Joseph ibn Aknin, physician in Aleppo died 1226, wrote extensively on philosophical subjects. His medical writings are on food and a commentary on the Aphorisms of Hippocrates.[93]

Abul Fadhl Daud el-Israeli, Karaite physician to the Sultan in the second half

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[85] Steinschneider pp. 178. Sarton II, p. 432, Wuestenfeld, p. 101, Leclerc II 53.

[86] Wuestenfeld p. 98, Sarton II p. 382, Steinschneider 182, Jew. Ency. art. Hibat Allah.

[87] Sarton II, 431, Jew. Ency. art. Benveniste, Sheshet.

[88] Sarton II, p. 433, Steinschneider, p. 197.

[89] Sarton II, p. 401, Wuestenfeld, p. 100, Steinschneider 186, Jew. Ency. art. Abbas.

[90] Sarton, II, p. 432, Leclerc II, p. 55, Steinschneider p. 194.

[91] Sarton II, p. 432, Steinschneider p. 193, Leclerc II, p. 52.

[92] Steinschneider, p. 159, Sarton II, p. 605, Jew. Ency. art. "Al-Harizi."

[93] Steinschneider, p. 228, Sarton II, p. 380, Jew. Ency. art. Joseph b. Judah ibn Aknin.

of the 12th century, wrote treatises on antidotes, on Galen's treatise, on causes and symptoms. He was the teacher of the Arabic medical historian Ibn abi Usaibia.[94]

Al-Asad al-Mahalli, philosopher and physician lived in Cairo, beginning of 13th century. He wrote several medical works (principles of medicine, etc.).[95]

Jephet, ibn abil Hassan al-Barkamani, a Karaite about middle of 13th century wrote a tract on hygiene.[96]

Ibn Kammuna, Jewish physician and philosopher in Egypt, converted to Islam, died 1277 wrote several philosophical works, and one opthalmological treatise.[97]

Abul Muna ibn Haffats al-Kuhin (Al-Kuhin al Attar) physician and botanist in Cairo about 1260, wrote a work on pharmacy which enjoyed great popularity. "One of the best Arabic works of its kind with regard both to substance and to form" (Sarton).[98]

Solomon Cohen, Egyptian physician, probably Karaite, died ca 1295, wrote a medical encyclopedia.[99]

Muwaffag al-Din, Samaritan physician and philosopher in Damascus, who died 1282, wrote a commentary on the Canon of Avicenna.[100]

Gregory Bar Hebraeus, Abu-l-Faraj, a Syrian, whose father, Aaron a Jewish physician had embraced Christianity, was born 1225, died 1286, became distinguished as physician, philosopher and historian. He wrote several works on medicine, in Syriac and Arabic, as well as on philosophy, botany, geography, history, etc.[101]

Solomon ibn Jaish, a physician in Seville, died 1345, wrote an extensive commentary on the Canon of Avicenna, in addition to his non-medical writings.[102]

Joshua ibn Vives al-Lorqui (probably not identical with convert of same name and later Hieronymus a Santa Fide), father of Joseph, a translator; at the request of Judah b. Beneviste, an officer of Saragossa (died 1411) he composed a work on food and drugs. It was translated into Hebrew by Joseph the son of Judah b. Beneviste, under the title of Gerem hama'aloth,[103] (term taken from Kings II, 9, 13). (Hebrew Ms. in library of writer.)

Shaban ben Isaac, known as Jani a Karaite in the 17th century translated Monardes' tract on tobacco in Arabic, describing the specific effects of this substance.[104]

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[94] Wuestenfeld, p. 128, Steinschneider 195, Sarton II, p. 665, Jew. Ency. art. "Fadl."

[95] Steinschneider p. 225, Sarton p. 665, Jew. Ency. art. "Asad."

[96] Steinschneider, p. 233.

[97] Steinschmeider, p. 239. Sarton II, 875.

[98] Steinschneider p. 239, Sarton II, 1097, Leclerc II 215.

[99] Steinschneider p. 233, Sarton II, p. 1098.

[100] Steinschneider p. 330, Sarton II, p. 1098, Wuestenfeld p. 144.

[101] Wuestenfeld 145, Sarton II 975, Jew. Ency. art. "Gregory."

[102] Steinschneider p. 167.

[103] Steinschneider, p. 170. Jew. Ency.

[104] Steinschneider, p. 256.

APPENDIX C

List of Principal Jewish Medical Translators and Their Translations into Hebrew

Translations from Arabic

THIRTEENTH CENTURY

This abridged list of translators and their works is taken from the Jewish Encyclopedia, article "Translations," after comparison with Steinschneider's Hebraeische Uebersetzungen upon which the former is based,[105] the systematic accounts of Sarton (Introduction &c.) have also been used. (Numbers in brackets thus (p. 770) in the following portion indicate pages in Steidschneider's Uebersetzungen, where the reference will be found.)

Moses ibn Tibbon, son of Judah, Provençal physician, flourished c. 1240–1283, translated Maimonides' treatise on hygiene, "Ma'amar be-Hanhagat ha-Beriut" (p. 770), one on poisons, "Ha-Ma'amar ha-Nikbad" or Hai-Ma'amar be Teri'ak (p. 764), a commentary on Hippocrates' Aphorisms (p. 769), a commentary on "Biur Arguza" (p. 699), and his Small Canon, "Ha-Seder ha-Katon" (p. 696); ibn al-Jazzer's "Zedat ha-Derakim" (p. 704); Hunain's introduction to medical science, "Mabo el-Meleket ha-Refu'ah" (p. 711); Razi's works on the classification of maladies "Ha-Hilluk weha-Hilluf" (p. 780) and on antidotes (p. 730).

Nathan ha-Meati of Cento, "the Italian Tibbonide" lived in Rome 1279–1283, translated the following medical works: "Ammar ben' Ali al-Mausuli's Al-Muntahib fi 'Ilaj al-Ain" on the treatment of diseases of the eye (670); the "Canon" of Avicenna (p. 679); the Aphorisms of Hippocrates, with Galen's commentary (pp. 659 and 662); the Aphorisms of Maimonides (pp. 766 and 776). Many anonymous translations are attributed to Nathan ha-Meati: Ibn al-Jazzar's "Memory & Amnesia" (p. 707); Abul Quasim al-Zahrawi's "Zeruf" (p. 746); and ibn Zuhr's "Sefer ha-Mezonot" (p. 749). A translation of Galen's commentary on Hippocrates' work "On Airs, Waters and Places," begun by Nathan, was completed in 1299 by his son Solomon (p. 663), whose son Samuel, "Prince of Translators," in turn concluded the translation of an extract from Galen's commentary on Hippocrates' work "On Regimen in Acute Diseases," (p. 663), and the translation of a medical work "The Lamp of Health" by Ibn Zuhr (p. 752).

Zerahiah ben Isaac ben Shealtiel Gracian, born in Spain, lived in Roma 1277–1288, translated the first two books of Avicenna's "Canon," (p. 681); a medical work of Galen from the Arabic of Hunain ibn Ishaq, "Sefer ha-Hola' im weha-Mikrim" (p. 652); three chapters of Galen's *Katagené* with the same title in Hebrew characters (p. 652); the "Aphorisms" of Maimonides, (p. 766).

Other translations (of the second half of the thirteenth century) were by Shem-Tob ben Isaac (born in Spain 1196, active in Barcelona, Montpellier and Barce-

[105] This subject is dealt with very fully and clearly in Sarton's Introduction to the History of Science, Vol. II.

lona, still living in 1267); Razi's "Al-Mansuri" (p. 725) and Zahrawi's "Al-Tasrif"' (p. 741).

Solomon ibn Ayyub (born in Granada, flourished in Beziers, work of translator (1240–1265): Avicenna's "Ardjuza" (p. 700).

FOURTEENTH CENTURY

The leading translator in the first twenty years of this century Kalonymus ben Kalonymus ben Meir (Maestro Calo, Provençal 1286–1328), who translated the following works: Ali ibn Ridwan's "Ha-Ammad be-Shoroshe ha-Refuah" (p. 733); Galen's treatise on Clysters and Colic (p. 663); Galen's essay on Venesection (p. 652).

Other Arabic works were translated in the fourteenth century by:

Ibn Vives al-Lorqui (Spanish physician, died before 1408): Various books of the "Short Canon" of Avicenna (p. 681).

Joseph ben Abraham ibn Wakkar (lived in Toledo 14th century): a medical work "Sefer Refu'ot," and Zahrawi's "Kitab al-Tasrif" (p. 746).

Judah Nathan ben Solomon (Provence, 14th century): Abu-l-Salt Umaiya's medical work "Kelal Kazer weha-Sammim ha-Nifradim" (p. 753), and ibn Wafid's "Simplicia" (p. 738).

Samson ben Solomon: The compendium of Galen's writings by the Alexandrians, "Ha-Kibbuzim le-Aleksandriyim" (p. 654).

Only a few works were translated during the fifteenth and sixteenth centuries.

Hayyim ibn Musa (born 1390, died 1460 in Spain) translated a medical work of al-Jazzar (p. 706).

Tanhum Moses of Beaucaire: Hippocrates' "Prognostics" (Panim le-Panim) (p. 666).

Among numerous anonymous translations special mention may be made of Isaac Israeli's works on Diet "Sefer Mehubbar mi-Maamareh ha-Rishonim be Jeba ha-Mezonot we-Kohatam (p. 756), "Sefer mehubbar mi Ma'amar ha-Rishonim be-Yedi' at ha-Sheten," (on Urine) (p. 758); Kitab al-Hummayat (on Fever) (759), and "Aphorisms," "Musar ha-Rofe'im" (p. 761); Maimonides' responsa on Hemorrhoids, "Ha-Ma'amarbe-Refu'at ha-Teharim" (p. 763), on Sexual Intercourse, "Ma'amar ha-Mishgal" (p. 763), on Poisons, "Al-Sumum wal-Mutaharriz min al-Adwiyah al-Kitalah" (p. 764), and the commentary on Hippocrates' "Aphorisms" (p. 756).

TRANSLATIONS FROM LATIN

The oldest known Hebrew translation from the Latin belongs to the thirteenth century. About 1250, Solomon ben Moses of Melgueil of France translated Matthew Platearius, "De Simplici Medicina" (p. 721).

Toward the end of the century Samuel ben Jacob of Capua translated "Meha-Ezah weha-Teba'im" from a Latin version of a work of Mesue, the Elder (p. 718). About the same time Hillel ben Samuel of Verona translated from Latin ibn Rid-

wan's commentary on Galen's Tegni, Galen's "Aphorisms" (p. 660), and Bruno's Chirurgia (p. 660) (See Sarton, Introduction Vol. II p. 886).

About 1306 Estori Farhi translated "Armengaud son of Blaise's, "De Remediis" (p. 778), and under the title "Sefer ha-Kibbusim" (p. 835), an anonymous work on purgatives. In 1327, Israel Caslari of Avignon, translated, under the title "Ma'amar be-Hanhagat ha-Beri'ut," Arnold of Villanova's "Regimen Sanitatis" (p. 779).

Other translations from the Latin were as follows: John Paulinus' treatise on the medical virtues of the skin of the serpent "Ma'amar bi-Segull-ot'Or ha-Nahash" (p. 806), by David ibn Bilia, of Portugal; Francesco dei Cenneli's book on the plague (p. 790), the Consilia of Gentile da Foligno's (p. 791), and perhaps John of Burgundy's "Consilia," "Ezah" (p. 804), by Joshua of Bologna (p. 791); and Gilbert's "Compendium" (p. 798) was translated in abstract by Judah Nathan; Bernard de Gordon's "Lilium Medicinae," "Perah ha-Refu'ot," (p. 785), by Moses ben Samuel of Roccambra (John of Avignon), and by Jekuthiel ben Solomon of Narbonne (p. 785) "Shoshan ha-Refu'ah"; Bernard Alberti's "Introduction into Practice," Arnold of Villanova's "Medicationis Parabolae" (p. 780), and his work on digestion and purgatives (p. 783), the commentary of Gerard de Solo on the ninth book of Razi's "Al-Ṁanzuri" (p. 794) were all translated by Abraham Abigdor of Montpellier. Gerard's manual of medicine (p. 797) "Moyashsher ha-Mathilim" a chapter on the relation between astronomy and medicine attributed to Hippocrates (p. 666), and Bernard de Gordon's "Lilium Medicinae" (p. 786) by Leon Joseph of Carcassonne; Arnold de Villanova's "Digestiva," by Todros ben Moses Yom-tob (p. 783); Arnold de Villanova's "Tabula super Vita Brevis" by Gabriel of Milhaud (p. 489).

THE FIFTEENTH CENTURY

Asher ben Moses Valabrega translated Guy de Chauliac's "Chirurgia Parva" (p. 803).

Azariah ben Joseph ben Abba Mari, the twenty-eighth book of Zahrawi's "Liber Practicae" (after the Latin of Simon of Genoa (p. 741), and the second book of the "Simplicia" of Dioscorides (p. 650)).

Benjamin ben Isaac of Carcassonne: Juan de Burgundia's treatise on the spread of the plague, "Be'Ippush ha-Awwir weha-Deber" (p. 804).

Isaac Cabret: John de Sancto Amando's "Expositio in Antidotarium Nicolai" (p. 806).

Joseph ben Benveniste translated Joshua ben Joseph ibn Vives al-Lorqui's treatise on the values and effects of foods, and simple and compound medicaments, "Gerem ha-Ma'alot" (p. 762) (Ms. copy in library of writer.)

Judah Shalom (Astruc) ben Samuel: a commentary on Hippocrates' "Aphorisms" (p. 661).

Moses ben Mazliah: Serapion's "Simplicia," from the Latin of Gerard de Cremona (p. 737).

Solomon ben Moses Shalom: Guainerius' "De Febribis," "Kelal meha-Kaddahut" (p. 799), and Montagnana's "Consilia Medica" (p. 811).

Moses ben Immanuel translated Thaddeus' treatise on fevers under "Kelal Kazer al Minhag ha-Kaddahut" (p. 832).

After the sixteenth century Hebrew translation from the Latin became very scarce. The following may be mentioned: Albertus' (Magnus?) "Questions and Answers on the Six Natural Things Required by the Body According to the Science of Medicine" translated by Moses ibn Habib (p. 776).

TEXTS AND DOCUMENTS

TRANSLATION OF A FOURTEENTH CENTURY FRENCH MANUSCRIPT DEALING WITH TREATMENT OF GOUT

HYMEN SAYE

Paul Meyer was indefatigable in the discovery and publication during the nineteenth century of rare medical manuscripts in the Romance field. By virtue of his deep knowledge of scripts and dialects he made a remarkable discovery in connection with a medical manuscript from which our translation is made.

Among the collection of Old French and Latin mss. sold to Count Ashburnham in 1847 by Libri there is one which Meyer edited and published in *Romania*, XV, (1886), pp. 181–187, under the name of *Montpellier 164 and Libri 96*. He gave it this double title because, by comparison of several similarities in the manuscript under consideration and another manuscript in the *Bibliothèque de l'Ecole de Medecine de Montpellier*, he came to the conclusion that Libri stole the manuscript from the Bibliothèque and sold it to Ashburnham. Meyer's comparison was made on the basis of the script, the number of columns per page, pagination and the appearance of the name of the "patient" in both mss.

The present fragment consists of twelve sheets written in a heavy Gothic script of the fourteenth century, two columns to a page, with 35 to 39 lines each. These twelve sheets form two cahiers, one of four double leaves, the other of two.

As to the source of the manuscript: Among the first pages of the fragment appear in the same Gothic hand, two couplets, which prove conclusively the original ownership.

Quant les vivans s'amanderont
Toutes mes *trompes* tromperont.

Ma *trompe* sonnera haulx ton
Quant le monde devendra bon.

The italicized words appear in the manuscript in the form of a trumpet (trompe) crudely drawn. This emblem was part of the escutcheon of a family which had considerable renown in Metz from the fourteenth to the sixteenth centuries, the family *d'Esch*, in our manuscript, *d'Aix*. Secondly, the medical fragment is preceded by the words: *Pour lez goutte S^r^ Jehan d'Aix*. This Jehan, according to Meyer, was a member of the famous family and occupied a magistracy in 1373, and died before 1398.

The circumstances leading to the production of the manuscript seem quite clear. Jean d'Esch (or Jehan d'Aix) suffered from gout, and having unsuccessfully consulted the physicians of Metz, probably addressed himself to a certain Jehan Le Fevre de Metz (the name occurs at the end of the manuscript) who besides being a fellow-townsman had the additional advantage of residing at the time in the medical center of Montpellier.

It is considered unusual by Meyer that a physician should substitute French, or rather the Metz dialect, for the scholarly Latin in a written treatment such as the following. It is highly improbable that the manuscript is a translation from the Latin. The form we possess is more possibly the permanent copy made by Jehan d'Esch from the original sent to him by Jehan Le Fevre, whom, incidentally, it has been impossible to find in any biographical list.

Most of the treatment recommended is *de rigueur* considering the period. General prohibition of foods and drink, diet, recipes of a herbal nature, and superstitions form the greater part of the treatment. There is also an unusually modern note in the statement promising relief from the pain, but not immediate and complete recovery. This is in sharp contrast with the usual certainty and finality which characterizes the remedies of the Middle Ages, which usually end with the dictum: *si garira* (he will be healed).

The advice of Jehan Le Fevre, physician of Montpellier, for the treatment of gout. For the gout of Jehan of Aix:

1. Here is how you must conduct yourself against your gout. First of all, take care that you do not eat peas or beans or other legumes, or chestnuts; however, you may eat pea-soup or chick-pea soup, but not too often.
2. Likewise, guard yourself against eating any food made with dough,

that is, dough cooked in foods or beverages; or which has been dried previously and then cooked in vinegar, either with meat or with cheese; or which has been preserved in honey, such as spiced bread which is called *aweclique* (?).

3. Likewise, guard yourself against eating all muddy fish, such as eels, tenches, crabs, loaches and other similar fish; and briefly, if you can guard yourself against eating any kind of fish, you will do well, especially against all fish from muddy waters, such as the River Saille is.
4. Likewise, guard yourself against eating any viscous meat, such as pork, whether old or young; and against all fowl which live and breed in water, such as geese, female ducks, mallard ducks, and other such, whether domesticated or wild.
5. Likewise, guard against drinking new wine until it be fermented and strained; and against all strong wines such as those made with spices and clarified, and sage wine, and other such spiced wines.
6. Likewise, guard against eating any cheese or vinegar.
7. Likewise, guard against eating meat of rabbits or old oxen.
8. Likewise, guard against eating several kinds of meats at dinner or supper.

(7)9. Likewise, guard against sleeping too soon after eating.

(8)10. Likewise, guard against drinking too much, and at improper times.

(9). Likewise, guard against eating anything strong and sharp, such as pepper, rocket, mustard, garlic, onions, leeks, and similar things.

(10). Likewise, guard against eating any salt fish or salted meats.

11. Likewise, guard against eating any fruits. However, when the weather and season permit, you may eat black plums, and slightly sour cherries, such as *brequenades* (?).
12. Likewise, do not wash your hands often at times when you feel your illness, unless you are first bled, or unless your body is first purged by medicine.
13. Likewise, guard yourself from exertion, whether in walking or otherwise, and from heavy work, soon after you shall have eaten.
14. Likewise, guard against plucking the skin from your feet; against riding if your legs are calloused; and against riding on a full stomach.

15. Likewise, guard against intercourse with women, and against all distress due to hatred or sadness; against very great worries; and against being up too late. In winter, cover well your head and your entire body; and you must especially guard your feet against cold as much as you can.
16. Likewise, take care that neither the vamp of your hose nor of your shoes be too narrow.
17. Likewise, guard against eating pears which are eaten during the winter, as well as apples, quinces, chestnuts, old raisins, and turnips.
18. Likewise, guard against eating fowl which is too old.
19. Likewise, guard against lying on your back.
20. Likewise, guard against drinking pure wines or too subtle wines, and against tasting vinegar too often, and against using sour foods, and all breads without leaven and badly baked, such as cakes and bread which are too white.
21. Likewise, guard against all nuts, large and small.
22. Master Jehan of Aix, in order that you may know which things can help you or harm you in your illness, I have listed these things for your benefit, and point out to you that, if you take care in guarding yourself from the things mentioned above, and if you do the things which follow and which I prescribe for you, there is no doubt that the pains of your illness will not be at all as heavy nor as grievous as they have been, but that you will notice therein a perceptible relief; nor will the accesses which you are accustomed to bear be so painful as they have been, nor will they attack you as frequently. But do not be surprised if you do not notice quick relief; for it is very difficult to combat this malady. Here follows, therefore, that which it is necessary for you to do and to order for your regimen, in regard to your food and every other matter.
23. Here is how you must conduct yourself. First, as to your food, you must eat bread which is well-baked and well-leavened, not too hard nor too white; and drink red wine which is not too sweet, but let it be clarified and cleansed of all superfluities. Eat the meat of a suckling calf or of a young bull, not too old, and meat of lambs one year old, or a year and a half, at the

most. Eat chickens, young chicks and partridges, small fowl, young rabbits, and sometimes the legs and snouts of pigs, and the stomachs of calves and sheep.

24. Likewise, guard yourself as much as you can, and especially during the summer, against drinking any wine unless it be diluted with water.
25. Likewise, when you fast, or during the time when people fast, whether during Lent or at any other time, you may eat barley with almonds, or rice made with an abundance of almonds, and the purée of chick-peas.
26. Likewise, all things which can be sipped are beneficial.
27. Likewise, during the season when the peaches are good, you may eat one which is very ripe, and you may also eat black plums and sour cherries.
28. As for vegetables, you may take some borage, Lombardy cabbage, spinach, lettuce, seeds of white cabbage, and a little parsley.
29. Likewise, as for sauces, you can take in your cakes and in your sauces some of this powder, not too much of it, but in small quantities: R. take white ginger two ounces; one-half ounce of coriander which is to be boiled in vinegar and well-dried and well-prepared; cloves and saffron as much of one as of the other, the weight of a dram; very fine cinnamon, six drams; and of all of these things make a good powder. And this powder you will blend with crumbled almonds, and make thereof a sauce, with a little verjuice, or sour wine. Or with this powder, you may spice your cakes, especially during the summer, when the cakes are withdrawn from the oven.
30. Likewise, you may take milk of almonds diluted in pomegranate juice, or in verjuice; and since at Metz, you cannot obtain pomegranates, it will suffice if it is made with verjuice. Make it in the form of a sauce which is common with roast meat or fish. Add to it finely ground cinnamon, with an abundance of almonds and vinegar; and in winter, add white ginger.
31. I commend to you and counsel you above all to take often preserved and well-prepared coriander, or pure coriander prepared without sugar. Of the preserved [coriander], take some before and after supper, or when you drink, or take at other times, for

you will notice several benefits from it, both for the stomach and for your ears, for it prevents the ears from tingling; and [it is beneficial] for your eyes, for you will see more clearly on account of it, and it keeps the eyes from dimming; and it sharpens and strengthens the appetite, and guards the gums from rotting and from odor and quinsy, and from many other maladies which, for the sake of brevity, I will not mention.

32. And know thou that it is beneficial against and resists all venomous humors and vapors, and prohibits the humors which are the cause of these gouts from descending into the joints; and therefore I counsel you as much as I can for your benefit, that you take some every day.

33. Now, heed well all that is forbidden you and all the things which I have forbidden you above, as well as those which are permitted you for your conduct, and how you are to make use of them. And since this malady can be guarded against only with difficulty, therefore I write for you immediately following, what things you ought to do to lighten your malady, and perhaps you may be able to be cured completely. But, nevertheless, that which I write you here, I do to lighten your malady, and you will never have it again as strongly nor as often as you have had [it].

34. As for the regimen to guard your health and continue it (or to guard it), it would be well and beneficial to have yourself bled in the month of March or at the beginning of the month of April, or in the middle of that month, from the *vena communa* of the right arm, if it seems too full or too thick, and draw one-half pound of blood, that is, one-half of a chopine,[1] or at least four ounces.

35. And before you do this, if your stomach is hard, loosen it with some purgative, that is, by means of a light clyster or by *cassia fistula*. In causing the bleeding, I believe that neither the temperature nor the state of health of the body or of the stomach should be opposed to the bleeding. [Nor should there be] other visible impediments, such as a great flux of the stomach (diar-

[1] A "chopine" was one-half of a Parisian pint.

rhoea), or hemhorroids, or violent and cutting vomiting which often take hold of certain bodies.

36. And since you have not written me at all the symptoms of your gout, nor of what cause or matter it comes to you, whether from blood or phlegm or bile or black bile, therefore, I do not write you at all the form for the digestive which you ought to take after the bleeding; wherefore it is necessary for you to take the counsel of some physician of Metz who knows how to formulate some digestive appropriate against the matter which is the cause of your malady, and which you will take after your blood-letting.

37. And after this digestive you will take this medicine to purge you, the receipt for which follows: You will take electuary of *succo ros.*, and the day you take a purgative, have a good regimen with the counsel of a good physician.

38. And guard against having yourself bled at the time when the moon is in the sign of *Gemini*, or in the beginning of the autumn, and the entire month of September. When you will have yourself bled, do it on the left arm and from the *vena communa* called *basilica*, up to three ounces, having first softened and purged the stomach, if it was hard and constipated.

39. Now, I come to the particular remedy, that is to remove or abate the pain which you suffer in your feet. For if great heat, coupled with the pain, holds sway over your feet, take oil of roses, and oil of *anet vel mirtino*, and oil of camomile. Take two parts of the oil of roses and one of the oil of camomile, another part of the oil of *anet* or of the myrtle, and mix them all together. Take these oils mixed thus, slightly tepid, and anoint the place where you feel the pain; and if the weather is cold, do not warm it, but anoint the pain with it, *tout froid*.

40. And if these things do not help, and if the pain is not abated, make this ointment and anoint with it the place where the pain is. Here is the receipt: *R. farine ordei opii ana .j. d.; misceantur cum succo solatri et tribus vitellis ovorum et fiat unguentum. Item, ad idem valet*, it is beneficial for the same: *herba psilii trita et cum oleo rosaceo frixa modicum*, and place it upon the pain.

41. And if these things still do not benefit, make the following oint-

ment: *R. spodi camphore memiche acacie ana .j. d., opii grana tria, conficiantur cum aqua lactuce vel portulace vel succo plantaginis vel cum aqua solatri.* Likewise, for this [malady], this salve is beneficial: *R. allium de pluma ceruse, boli armenici ana .iiij. d., mastic thuris, ana .ij. d.; tereantur omnia cum .iiij.^{or} albumnibus ovorum vel cum succo portulace, lactuce, endivie, vel plantaginis distemperentur.*

42. Likewise, here is another approved remedy to make the pain cease: *R.* take a bit of very white bread and crumble it into cow-milk, and crumble and break it so in that milk that it resemble an ointment; add to it one-fourth part of *opii*, and mix them well together with the milk, and put all this on the fire, and then put it, quite warm, upon the pain.

43. And you ought to note that the salves and unguents which are here described one ought to put on the pain only in the beginning of the illness; for when it [the malady] increases, after having continued [to apply the salve] three or four days, and the malady has arrived in its status, you may use the following salve and medicine: *R. rosarum rub. d.s.*[*emis*], *croci, j. d., camo. melliloti ana d. s.; conficiantur cum succo vel cum aqua decoctionis coriandri.*

44. Likewise *ad idem: R. succi mente d.s., aloen .ij. d., opii d.s., pulveris camomille et melliloti quod sufficit; fiat emplastrum, et tepidum apponatur.* Likewise, *ad idem: R. boli armenici, aloen, croci, ro., mirti, ana conficiantur cum aqua coriandri.*

45. And when the malady begins to decrease, in order to dissolve and lessen the matter which causes the gout of the feet, you should make this epithem. *R. ceruse nove .j. d.*, melt and dissolve in oil of lilies *et adde muscillaginis fenugreci d.s., et semin lini .j. d.*, and crumble these things together and make an epithem of them.

46. This also is beneficial: *R. cere .ij. d., olei aneti .j. d. et s.; dissolvatur ierapigra in predicto oleo et post addatur camomille pulvis cum axungia galline vel anatis, simul misceantur* and make an unguent and place it upon the pain, slightly warm.

47. Likewise, in the greatest pain due to gout, the supreme remedy which quickly causes the pain to cease, make this receipt: *R. succa solatri montalis lb. .j., zz*[*zinziberis*] *bene pulverizati d.s., vitellis ovorum .iiij^{or}.; misceantur omnia et stupe canabine inbibantur et super locum ponatur.*

48. But know thou that all these remedies aforementioned are ordered for gout of the feet which comes from a warm cause, for if it come from a cold cause, they will do more harm than good; however, if you feel great heat in the foot or at the place where you suffer from gout as well as pain, then it comes from a warm cause; and if you feel cold, it comes from a cold cause.
49. Inform me through some one who comes to Montpellier if the member in which you feel the pain is cold, and then I will prescribe for you remedies against it which may aid you, for that which I write you here is only against gout due to warm cause; and this you may clearly see, inasmuch as the place of the pain must be red and hot.
50. Likewise, you can relieve the member in which the pain is, so that the bad matter does not descend there, by putting upon it some beneficial salve like this: *R. lucci sigillaci .j. d. et s., olei mirtini, spice, nardi, ana .j. d., acacie, mirre ana .j. d. et s., mic. cypressi s., ro. s., squinanci s., cere nove s., lapdani d., in olei camo., quod sufficit ad incorporandum; dissolvantur dissolvenda in predictis oleis et fiat emplaustrum quod ponatur supra pannum et involvatur menbrum dolens.*
51. *Ad idem*, here is another salve which you may use from the beginning to the end of your illness. *R. hermodactillorum .ij. d., pulverizentur et deinde addatur farine ordei .j. d., vitella ovorum quod sufficiant ad incorporandum, et fiat emplastrum.*
52. Likewise, *R. fabas cum corticibus et coque in aqua, et postea cola et aquam ponas in caldario novo; post accipe semen malvasti, semen citoniorum, semen lactuce, semen papaveris albi, ana .ij. d., semen plantaginis, fenugreci et aneti, fol. ro., semen caulium, mandragone, sandallorum, cicerum, ana .j. d.; coque totum in aqua plantaginis ita quod cooperiantur medicine, donec remaneat medietas deinde cola et misceatur tantumdem oleum ros, quousque consumatur aqua, et renoveas oleum, et postea pondera oleum et cuilibet ponderi in d. appone .iij. d. cere albe et .iij. d. de cepo de renibus vituli, et misce totum et utere cum opus fuerit.*
53. Likewise, here is another salve which is beneficial in comforting the member wherein is the pain, and which very gently destroys and dissolves the bad matter and prevents it from descending

to the hurt member, and it comforts the pain. *R. re. cubebar .j. d., nuc. indic. .ij. d., edere terrestris .j. d., achori .j. d., verbene s., flore calcane .j. d., luci sigillati .j. d., cere nove s.; dissolvatur cera in oleo mirtino et camomillino equalibus partibus, addendo de oleis predicitis quod suficit ad incorporandum, et fiat emplastrum.*

54. Likewise, bathe the feet in water in which have been cooked, *id est in aqua decoctionis florum amigdalarum camomille et foliorum mirte atque melliloti.* It comforts them very much.

55. Likewise, bathe them in new wine, it comforts them very much. Likewise, bathe them in water in which the flesh of a fox has been cooked, and so well cooked that it has become loosened and dissolved. Also beneficial against this malady is the oil in which the flesh of a young fox has been cooked; the foot ought to be anointed with it; but first you must be bled and take a purgative.

56. And if these things do not help, it will be necessary to use surgery, a hot, burning iron, and put the burning iron four fingers below the ankle, on the outside, and also three fingers below the knee. But take care that this be done with the advice of wise and alert surgeons.

57. As for the present, I write you no more, except that I beg you to have a good physician who knows how to order the receipts which I prescribe and send you, and that he be present in the shop of the apothecary, for I believe that you will not be able to read or understand them; and take care not to take any of the aforementioned things which are forbidden you, if you wish to regain your health and not feel the pains which you are accustomed to feel. But use those things which I have prescribed, and keep the regimen which I have ordered.

58. And if you have not all or any of the things which are contained in the aforementioned receipts, send to Montpellier by some one of your merchants who is accustomed to come here, or by any messenger, and send me in writing the name of the herb or any other thing, and the money to pay for them, and I will send them to you. Write me also if your illness is due to a cold cause, insofar as you are able to perceive by what I have written above, and I will order for you, with the help of my masters, that which will be beneficial for you against the malady.

59. And, as I have said above, if at the time you feel your pain your feet are warm, then the malady comes from a warm cause, and if they are cold, it comes from a cold cause; and above all, do as I have prescribed for you.

Jehan Le Fevre, of Metz, yours to serve you and yours, according to my ability, willingly and with all my heart.

NOTES AND COMMENTS

ON THE TEACHING OF MEDICAL HISTORY

A Tentative Syllabus for a Course in the History of Medicine

HENRY E. SIGERIST

Most medical schools in this country have recognized the educational value of medical history, and are endeavoring to give their students some kind of instruction in the field. Most medical schools, however, have no special instructor of medical history, and the course therefore will have to be given by a member of the faculty interested in the subject.

In the last few months I have repeatedly been asked for advice as to how such a course should be organized, and this induced me to write this syllabus, which may be helpful to instructors as well as to students.

There are many different methods of teaching medical history, and in fourteen years of experience in three universities I have tried them all. The first point on which to decide will be the length of the course. At the Hopkins, as the readers of the Bulletin will know, the instruction in medical history extends over the four years of the curriculum. A short lecture course is offered to the freshman class in the beginning of the academic year, which is a mere introduction tracing the broad lines of development, the history of the leading ideas and the leading men, and acquainting the students with the classics of medical literature. The essential instruction then is given in seminar courses, the subjects of which are related in one way or another with the curriculum of the year, and in which the students take an active part. In those medical schools which have no organized department of medical history, the instruction as a rule will be limited to a single course.

The following syllabus has been arranged for a course of twelve hours, which to me seems to be the minimum time required for covering the entire field, even in mere outlines. If more time is available the course may very profitably be extended. The lectures indicated below can be split up easily.

Another important question is whether such a course should be given as a lecture course or as a seminar. This will depend largely on the number of students. If the entire class attends the course, the instructor necessarily will have to lecture, as it is impossible to handle a large crowd in a seminar. But if the group of students is small, the seminar form is undoubtedly far superior: in a seminar the student is not told how things were, but he has to find out for himself. The instructor's task is to advise the student as to what he should read, to criticize his paper, to lead the ensuing discussion, and to round out the picture given by the student.

Whether a lecture course or a seminar course is given, it is essential that the student should not only hear but should also see as much as possible—books, pictures (lantern slides), documents, objects—whatever is available. And he should be encouraged to read at least some of the medical classics in English translation. Therein lies much of the educational value of medical history—that the student be acquainted with the work of those men who laid the foundations of modern medicine, not through second-hand references but directly. Studying the original works, the student will see in what form the great discoveries were presented and he will realize that clear writing is the result of clear thinking.

The syllabus has been arranged so as to serve both a lecture course or a seminar course.

The references to literature have been restricted to a minimum of those books which are available or ought to be available in a medical school library. Additional references, and references to general histories of medicine, and to histories of medical specialties are given in *A Revised Student's Checklist of Texts Illustrating the History of Medicine*, by Fielding H. Garrison, published in this Bulletin (Vol. I, 1933, pp. 333–434). Books in foreign languages are quoted only where there is no corresponding English book.

The books marked with an asterisk are those which I would recommend to the students to read, and which form the basic material for seminar discussions. The other books should be studied by the instructor, and should be demonstrated to the students. It is obvious that general histories of medicine should be studied constantly.[1]

[1] Fielding H. Garrison, *Introduction to the History of Medicine*, 4th edition, Philadelphia, 1929. Sir William Osler, *Evolution of Modern Medicine*, New Haven,

Medical history is but one aspect of general civilization, and therefore cannot be understood fully unless one has some knowledge of the cultural background of a given period. This is why I give a few references on general literature.

1. THE BEGINNINGS. PRIMITIVE MEDICINE

How old is disease? Evidence of disease in fossil animals, in prehistoric and early historic man (Paleopathology).

Prehistoric man. Paleolithic wall paintings as documents of early observation of nature. Trephining of skulls in neolithic France and in Central America.

Medicine among primitive people. The primitive mentality. Mystical conception of the world. Primitive medicine a compound of empirical knowledge, religious and magical conceptions. The views on the causes of disease determine all further actions. The medicine man.

Primitive medicine never died but survived in folk-medicine, in various aspects of religious medicine (Lourdes, Christian Science), and in superstitions.

LITERATURE. Sir Marc Armand Ruffer, *Studies in the Paleopathology of Egypt*, Chicago, 1921. *Roy L. Moodie, *Paleopathology: an Introduction to the study of ancient evidences of disease*, University of Illinois Press, Urbana, Ill., 1923. Roy L. Moodie, *Antiquity of Disease*, Chicago, 1923.

Lucas-Championnière, *Trépanation néolithique, pré-Colombienne, etc.* Paris, 1912. H. F. Osborn, *Men of the Old Stone Age*, New York, 1916.

Franz Boas, *Mind of Primitive Man*, New York, 1911. Lucien Levy-Bruhl, *Primitive Mentality*, London, 1923.

Max Bartels, *Die Medizin der Naturvölker*, Leipzig, 1893. W. H. R. Rivers, *Medicine, Magic and Religion*, London, 1924 (Useful on account of facts discussed, although I disagree with the thesis). George J. Engelmann, *Labour among Primitive Peoples*, St. Louis, 1882. *Eric Stone, *Medicine among the American Indians*, New York, 1932 (Clio Medica).

W. G. Black, *Folk-Medicine*, London, 1883.

1921. Charles Singer, *A Short History of Medicine*, Oxford University Press, 1928. Henry E. Sigerist, *Man and Medicine*, New York, W. W. Norton Co., 1932. Henry E. Sigerist, *The Great Doctors*, New York, 1933.

2. EGYPTIAN AND BABYLONIAN MEDICINE

Chronology

B.C	*Babylonia*	*Egypt*	*Medical*[1]
Before 3000	Sumerians migrate from North into Mesopotamia, Semites from South	Predynastic times. *Old Kingdom* Dynasty I–III	Imhotep
c. 3000–2500	Kingdoms of Sumer and Akkad	Dynasty IV–VI	Papyri of Kahun
c. 2000	First Babylonian Dynasty. Hammurabi	*Middle Kingdom*	Code of Hammurabi Papyrus Edwin Smith Papyrus Ebers Papyrus Brugsch Maior Papyrus Hearst
c. 1800		Hyksos invade Egypt	
c. 1746	The Kassaites conquer Babylonia		
c. 1550		*New Kingdom*	1350, Papyrus Brugsch Minor
c. 1250	Assyrian Empire		1200, London Papyrus
668–24	Assurbanipal		Kuyunjik Collection

I. *Egypt.* The Nile. Political and religious developments. Embalming. Imhotep. The physicians and the schools. Surgery (Edwin Smith) and medicine (Ebers), the specialties (Kahun, Herodotus). Theoretical attempts, the theory of the metu. Magic (Brugsch minor). The hermetic writings. Coptic medicine.

II. *Babylonia.* Mesopotamia. Euphrates and Tigris. Astrology and Astronomy. Religious character of Babylonian medicine. The physician a priest. Disease sent by the gods, directly or through evil spirits (Labartu, the Evil Seven).

The interpretation of omens gives the prognosis (divination liver). Disease symptoms considered omens. Incantations and exorcisms. Drugs. Legal regulations of medical practice (Code of Hammurabi).

III. *The Persians and the Hebrews.* Their medicine influenced by Babylonia. Zoroaster and the sacred books (Avesta). Three types of physicians (curing by incantations, by drugs, and by the knife). Regulations for the examination of surgeons. Fee code.

Medicine in the old Testament. Disease a punishment for sin.

[1] Indicating when the documents were *written.* Most of the papyri and cuneiform tablets preserved are copies of much older originals.

Hygienic consequences of the concept of cleanliness and of the food regulations.

LITERATURE. James H. Breasted, *History of the Ancient Egyptians*, New York, 1908. James H. Breasted, *Development of Religion and Thought in Ancient Egypt*, New York, 1912. *Jamieson B. Hurry, *Imhotep*, Oxford University Press, 1928. Abel Rey, *La Science Orientale avant les Grecs*, Paris, 1930. The Petrie Papyri. Hieratic papyri from Kahun and Gurob. Ed. by F. L. Griffith, London, 1898 (Kahun VI.1 and LV.2). *James H. Breasted, *The Edwin Smith Surgical Papyrus*, 2 vols., Chicago, 1930. **The Papyrus Ebers*, translated by Cyril P. Bryan, London, 1930 (The translation was made from a German translation, and therefore is not quite reliable). *Der Grosse medizinische Papyrus des Berliner Museums*, herausgegeben von Walter Wreszinski, Leipzig, 1909. *Der Londoner medizinische Papyrus und der Papyrus Hearst*, herausgegeben von Walter Wreszinski, Leipzig, 1912. Adolf Erman, *Zaubersprüche für Mutter und Kind aus dem Papyrus 3027 des Berliner Museums*, Berlin, 1901.

R. W. Rogers, *A History of Babylonia and Assyria*, New York, 1915. H. R. Hall, *The Ancient History of the Near East*, 1920. Morris Jastrow, *Aspects of Religious Beliefs and Practice in Babylonia and Assyria*, New York, 1911. *R. Campbell Thompson, *The Devils and Evil Spirits of Babylonia, Vol. 1 "Evil Spirits," Vol. 2, "Fever Sickness" and "Headache," etc.*, London, 1903–04. *Friedrich Küchler, *Beiträge zur Kenntnis der Assyrisch-Babylonischen Medizin*, Leipzig, 1904. R. Campbell Thompson, *Assyrian Medical Texts*, New York, 1923 (texts without translation). R. Campbell Thompson, *The Assyrian Herbal*, London, 1924. Morris Jastrow, *Babylonian and Assyrian Birth Omens*, Giessen, 1913. Chilperic Edwards, *The Hammurabi Code: and the Sinaitic Legislation*, 3rd edition, London, 1921.

The Zend-Avesta, Oxford, 1880–87 (Sacred Books of the East). Horst Fichtner, *Die Medizin im Avesta*, Leipzig, 1914. Julius Preuss, *Biblisch-Talmudische Medizin*, Berlin, 1911.

3. THE BEGINNINGS OF GREEK MEDICINE

1500 B.C. Ionian migration, assimilation of Cretan civilization (Mycenae).

1000 B.C. Dorian migration, destruction of Mycenae.

Medical views pictured in the Homeric hymns.

Asklepios. The legend (Hesiod, Pindar). The sanctuaries (Epidauros, 6th century B.C., Athens, c. 420 B.C., Rome 291 B.C.). The Cult (incubation), miracle cures (tablets of Epidauros).

The presocratic philosophy is the cradle of Greek science and medicine. What is nature? What is the primary cause of all things?

The Milesians (Thales, Anaximander, Anaximenes). Great influence of the Pythagoreans on medicine (Alcmaeon, Philolaus). Empedocles and the Sicilian school. Democritus and the atomists.

Medical conditions. Medicine originally a secret lore of certain families tracing their ancestry back to Asklepios (Asclepiades). Later outside members admitted after swearing an oath. The physician a craftsman practising while wandering. Municipal doctors.

Early medical schools, Croton, Sicily, Cos (Hippocrates), Cnidos (Euryphon).

LITERATURE. J. B. Bury, *History of Greece*, New York, 1922. E. A. Gardner, *The Art of Greece*, London, 1925. Walter A. Jayne, *The Healing Gods in Ancient Civilizations*, New Haven, 1925. **The Odes of Pindar* (Loeb Classical Series, New York, 1927, p. 185). R. Herzog, *Die Wunderheilungen von Epidauros*, Leipzig, 1931 (Greek text and German translation of the tablets relating cures found in Epidauros). H. Diels, *Die Fragmente der Vorsokratiker*, 3 vol., Berlin, 1912, 1922. *Charles M. Bakewell, *Source-book of Ancient Philosophy*, New York, 1907. *J. Burnet, *Greek Philosophy, Thales to Plato*, 1920. Th. Gomperz, *Greek Thinkers*, 1901–1905. *R. Livingston, *The Legacy of Greece*, Oxford. *Henry Osborn Taylor, *Greek Biology and Medicine*. New York, Longmans, n.d. *Charles Singer, *Greek Biology and Medicine*, Oxford, 1922.

4. HIPPOCRATIC MEDICINE

What do we know about Hippocrates? Plato the only contemporary source. The legend. Hippocrates the ideal that has inspired medicine at all times.

The Corpus Hippocraticum a collection of medical writings (5th and beginning of 4th century B.C.) brought together in Alexandria (3rd century B.C.). Character of the different treatises (textbooks, monographs, orations, notebooks), their different origin (Cos, Cnidos, Sicily).

Character of Hippocratic medicine. What did the physicians see? (Symptoms and groups of symptoms. Facies hippocratica, for example.) His concept of disease (Cos and Cnidos). Disease is a natural process having natural causes (environment, climate, season, mode of living, diet). The mechanism of disease, humoral theories (the four humors and their qualities). The innate heat. The stages (apepsis, pepsis, crisis). Emphasis on prognosis. Therapy, natural healing power of the organism (vis medicatrix naturae). First dietetics, then pharmacology, then surgery.

Highly developed personal hygiene. Ideal, the harmonious man, perfectly balanced bodily and mentally, beautiful and noble.

LITERATURE. *Oeuvres Complètes d'Hippocrate*, Paris, 1839–61 (Greek text and French translation by E. Littré) 10 vols. *The Genuine Works of Hippocrates*, translated by Francis Adams, New York, 1929 (Also published by Sydenham Society, London, 1849, 2 v.). **Hippocrates*, with an English translation by W. H. S. Jones and E. T. Withington (vol. 3), Loeb Classical Series, 4 vols., New York, 1923–31 (Read: Oath, Prognostic, Epidemics I and III, The Sacred Disease, On Joints, Airs, Waters, Places, Ancient Medicine). *Arthur J. Brock, *Greek Medicine. Being extracts . . . . of medical writers from Hippocrates to Galen*, New York, 1929. *W. H. S. Jones, *The Doctor's Oath*, Cambridge, 1924.

5. GREEK MEDICINE IN ALEXANDRIA AND ROME

Foundation of Alexandria in 333 B.C., developing under the Ptolemies into a center of learning. Academy, library, observatory. Collections of the Greek classics made. Hellenization of the ancient world. Anatomical studies, dissections of human bodies.

Three schools: 1. *Herophilus* (about 300 B.C.), his anatomical work (sensory nerves), pathology traditional, doctrine of the pulse, pharmacology and midwifery. 2. *Erasistratus* (about 260 B.C.), anatomy (sensory and motor nerves), doctrine of plethora, pathological anatomical considerations. 3. The *Empirics*. Philinus of Cos (about 250 B.C.), Heraclides of Tarentum (about 75 B.C.). Their reasoning, scepticism, practical achievements (pharmacology, surgery, obstetrics). A cross-section through Alexandrian medicine: The encyclopedia of Celsus.

Rome. Ancient Roman medicine. Healing deities, magical procedures. Empiricism of Cato. Slave physicians. Immigration of Greek physicians. Their rising social standing. Asklepiades of Prusa (1st century B.C.).

The methodicists, Themison of Laodicea, Thessalus of Tralles. Their atomistic theory. Status strictus, laxus, mixtus. Their "method" of treatment. Soranus of Ephesus (2nd century A.D.). His gynecology. The illustrated catechism of midwifery (Mustio), the illustrated treatise on wound-dressings. Caelius Aurelianus.

The pneumatic school (Archigenes). The eclectics, Aretaeus, Rufus of Ephesus. Pharmacology in Roman times. Dioscorides. Public health (aqueducts, thermae, military hospitals).

Galen (129 A.D.–about 199). His life, anatomical work, physiology, pathology (ars parva), therapy.

LITERATURE. W. W. Tarn, *Hellenistic Civilization*, New York, 1927. J. P. Mahaffy, *Greek Life and Thought from Alexander to the Roman Conquest*, 2nd ed., 1896. Tenney Frank, *A History of Rome*, New York, 1923. *Cyril Bailey, *The Legacy of Rome*, Oxford, 1924. Harold W. Johnson, *The Private Life of the Romans*, New York, 1932. *Sir Clifford Allbutt, *Greek Medicine in Rome*, New York, 1921. *Aulus Cornelius Celsus, On Medicine, in Eight Books, with Latin and English texts, by A. Lee, London, 1831, 2v. (or any other translation). Dioscorides, Codex Aniciae Iulianae . . . . phototypice editus, praefati sunt Antonius de Premerstein . . . . Lugduni Batavorum, 1906, 2 vols. (photographic reproduction of an illustrated manuscript). The Extant Works of Aretaeus, translated by Francis Adams, London, 1856 (Sydenham Society). Oeuvres de Rufus d'Ephèse, Paris, 1879 (Greek text and French translation by E. Ruelle). Claudii Galeni Opera Omnia (Greek text and Latin translation by C. G. Kühn) 22 vols., Leipzig, 1821–1833.

6. MEDICINE IN THE MIDDLE AGES

The rise of Christianity, its influence on the attitude of society towards the sick man. Benedict of Nursia (Monte Cassino, 529). Hospitals, their character.

1. Western development to the 11th century

Creation of a Latin medical literature. Translations (Cassiodorus, Vivarium, 538). Compilations and abstracts. The centers, North Africa (4th and 5th centuries), Bordeaux (5th century), Ravenna (6th century). The Benedictine monasteries (Monte Cassino, Bobbio, St. Gall, Reichenau). The Carolingian schools. The beginnings of Salerno (10th to 11th centuries).

2. Eastern development

Greek compilators (Oribasius, 4th century, Aetius of Amida and Alexander of Tralles, 6th century, Paulus of Aegina, 7th century). Byzantine literature.

The school of Jundi-Shapur, 6th century (Syrian translations).

Mohammed 571–632. The Umayyads, 661–750 (Damascus). The Abbasids, 750–1258 (Bagdad). Harun al-Rashid a contemporary of Charlemagne (about 800).

Translations of Greek medical books directly or from Syrian transla-

tions (Hunayn ibn Ishaq). Rhazes (865–925) the clinician. Avicenna (about 980–1037) the systematizer (Aristotle and Galen). Arabic science in Spain. The philosophers Averroes and Maimonides (12th century). The surgeon Abulcasis (10th century). The pharmacologist Ibn el Baytar (13th century). The historian of medicine Ibn Abi Usaybia (13th century).

3. Western medicine under the influence of the Arabs

Constantine of Africa (1010–1087), and the School of Salerno (its height in the 12th century). Character of the Salernitan literature. The regulations for the practice of medicine issued by Roger II and Frederic II (1140, 1240).

Spain as a center of transmission (Gerard of Cremona, 1114–1187). The universities (12th century: Montpellier, Bologna, Oxford, Cambridge, Paris. 13th century: Padua, Messina, Naples. 14th century: Prague, Vienna, Heidelberg, Cologne). The methods of teaching (lectio, disputatio). The methods of research (dialectical discussion of problems). Authorities (Avicenna and Galen). The types of medical literature (commentarium, concordantia, conciliator, summa, consilia).

The 13th century scholastic physicians (Pietro d'Abano, Arnald of Villanova, etc.).

The surgeons, their social standing and their achievements (Theodoric, Lanfranco, Guy de Chauliac).

"Anatomies" (first in Bologna, beginning of 14th century).

4. The great epidemics.

The plague (of Justinian, 6th century; "Black Death," 1348–39). Leprosy. Methods of combat and prevention. Influence of the Bible (Leviticus).

LITERATURE. J. B. Bury, *A History of the Later Roman Empire*, 2 vols., London, 1889. Lynn Thorndike, *History of Mediaeval Europe*, New York, 1928. *Charles H. Haskins, *Studies in the History of Mediaeval Science*, Cambridge, Harvard University Press, 1924. Charles H. Haskins, *The Renaissance of the 12th Century*, Harvard University Press, 1928. Charles Singer, *From Magic to Science, Essays on the Scientific Twilight*, New York, 1928. Lynn Thorndike, *A History of Magic and Experimental Science*, New York, 1923, 2 vols.

The Seven Books of Paulus Aegineta, translated . . . . by Francis Adams, 3 vols., London, Sydenham Society, 1844–1846. D. S. Margoliouth, *Mohammed and the Rise of Islam*, New York, 1905. *Sir Thomas W. Arnold, *The Legacy of Islam*, Oxford, 1931. *Edward G. Browne, *Arabian Medicine*, Cambridge University Press, 1921. Donald Campbell, *Arabian Medicine and its Influence on the Middle Ages*, London, 1926, 2 vols.

Salvatore De Renzi, *Collectio Salernitana* . . . . 5 vols., Naples, 1852–1859. Piero Giacosa, *Magistri Salernitani Nondum Editi*, Turin, 1901. *George W. Corner, *Anatomical Texts of the Earlier Middle Ages, a Study in the Transmission of Culture*, New York, 1927. *Francis Packard, *The School of Salernum* . . . . English Version by Sir John Harington, New York, 1920. H. Rashdall, *The Universities of Europe in the Middle Ages*, 3 vols., Oxford, 1895. Stephen D'Irsay, *Histoire des Universités*, Paris, 1933.

F. A. Gasguet, *The Black Death*, London, 1893. *A. M. Campbell, *The Black Death and Men of Learning*, New York, 1931. Zambaco Pacha, *La Lèpre à travers les Siècles et les Contrées*, Paris, 1914.

7. MEDICINE IN THE RENAISSANCE

Individualism. The discovery of the world. The revival of Greek culture in its totality. Humanism. The invention of printing. New attitude towards the world and towards the human body.

The foundation of human anatomy. The artists: Leonardo da Vinci (1452–1519). The physicians: Andreas Vesalius (1514–1564). His forerunners (Achillini, Berengario da Carpi, Canano) and followers (Colombo, Fallopio, Aranzio, Varolio, Eustacchi).

Medicine: newly discovered diseases (syphilis, typhus). Girolamo Fracastoro (1478–1553) and his theory of contagion. Paracelsus (1493–1541). Jean Fernel (1506–1588).

Surgery: Ambroise Paré (1510–1590).

The "Fathers of Botany" (Otto Brunfels, Hieronymus Bock, Leonhard Fuchs).

LITERATURE. J. Huizinga, *The Waning of the Middle Ages*, London, 1924. Henry O. Taylor, *Thought and Expression in the 16th Century*, 2nd ed., 2 vols., New York, 1930.

Leonardo da Vinci, *Quaderni d'Anatomia* . . . . published by Vangensten, Fonahn and Hopstock, Christiania, 1911–1916, 6 vols. *Leonardo da Vinci's *Note Books*, arranged and rendered into English by Edward McCurdy, New York, 1906. *James Playfair McMurrich, *Leonardo da Vinci the Anatomist*, Baltimore, 1930. *The Fasciculus Medicinae* of Johannes de Ketham, edited by Karl Sudhoff, Milan, 1923. Canano, *Musculorum Humani Corporis Picturata Dissectio, 1541* (Facsimile,

Florence, 1925, Monumenta Medica). Andreas Vesalius, *De Humani Corporis Fabrica, Libri VII*, Basel, 1543. Moritz Holl and Karl Sudhoff, *Des Andreas Vesalius sechs anatomische Tafeln vom Jahre 1538*, Leipzig, 1920. M. Roth, *Andreas Vesalius Bruxellensis*, Berlin, 1892.

Ludwig Choulant, *History and Bibliography of Anatomical Illustration*, translated by Mortimer Frank, Chicago, 1920. *Charles Singer, *Evolution of Anatomy*, New York, 1925. *George W. Corner, *Anatomy*, New York, 1930 (Clio Medica).

Karl Sudhoff, *The Earliest Printed Literature on Syphilis* . . . . 1495–1498, facsimile edition edited by Karl Sudhoff, adapted by Charles Singer, Florence, 1925. *Girolamo Fracastoro, *De Contagione et Contagiosis Morbis et eorum Curatione, Libri III*. . . . Translated and with notes by Wilmer Cave Wright, New York, 1930. Theophrast von Hohenheim gen. Paracelsus *Sämtliche Werke*, ed. by Karl Sudhoff, Berlin, 1922-, 14 vols., (in course of publication). Theophrast von Hohenheim (Paracelsus) *Sieben Defensiones* . . . . Karl Sudhoff, Leipzig, 1915 (Klassiker der Medizin). John Maxson Stillman, *Theophrastus Bombastus von Hohenheim, called Paracelsus*, Chicago, 1920.

Oeuvres Complètes d'Ambroise Paré, ed. by J. F. Malgaigne, Paris, 1840–1841, 3 vols. *Dorothea W. Singer, *Selections from the Works of Ambroise Paré*, London, 1924. *Francis R. Packard, *Life and Times of Ambroise Paré*, New York, 1921.

8. MEDICINE IN THE 17TH CENTURY

The philosophical background (Giordano Bruno, Francis Bacon, Descartes, Leibnitz).

The scientific background (Galileo, Kepler, Newton, Gilbert, Torricelli, Huygens).

The scientific societies; Accademia dei Lincei (Rome, 1603), Accademia del Cimento (Florence, 1657), Royal Society (London, 1662), Académie des Sciences (Paris, 1666), Collegium Naturae Curiosorum (Halle, 1652).

The microscope (Galileo). Antonj van Leeuwenhoek (1632–1723) and his microbiology. Marcello Malpighi (1628–1694), microscopic anatomy and embryology. Robert Hooke (1635–1703), plant cell.

The foundation of anatomical physiology. Causal and quantitative experiments. The discovery of the pulmonary circulation (Ibn an-Nafiz, 13th century; Michel Servetus, 1553; Realdo Colombo, 1559). The discovery of circulation (1628) by William Harvey (1578–1657). The venous valves described by Fabricius of Aquapendente (1603).

The Iatrophysicists: forerunner, Santorio (1561–1636, clinical thermometer, pulsilogium), then Francesco Redi (1626–1694, against spontaneous generation), Alfonso Borelli (1608–1679, De Motu Ani-

malium 1680–81), Giorgio Baglivi (1668–1707 height and end of the movement).

The Iatrochemists: forerunner, Jan Baptista van Helmont (1577–1644), then Franz de le Boë (Sylvius) (1614–1672), Thomas Willis (1621–1675).

Brilliant scientific development, at the same time poor status of practical medicine in the first half of the century (numerous satires). But then, Thomas Sydenham (1624–1689), the "English Hippocrates." New concept of disease.

Numerous monographs on single diseases; apoplexy (Wepfer, 1658), rickets (Glisson, 1660) pulmonary consumption (Morton, 1689), heart diseases (Vieussens, 1715; Lancisi, 1728), occupational diseases (Ramazzini, 1700).

Introduction of the Cinchona bark from Peru (1632) as a remedy for malarial fever. Influence on theoretical views.

Vital statistics (John Gaunt, Natural and Political Observations upon the Bills of Mortality of the City of London, 1662).

LITERATURE. W. T. Sedgwick and H. W. Tyler, *A Short History of Science*, New York, 1927. *Martha Ornstein, *The Rôle of Scientific Societies in the 17th Century*, 1928. R. S. Clay and T. H. Court, *History of the Microscope*, London, 1932. *Clifford Dobell, *Antonj van Leeuwenhoek and His "Little Animals,"* New York, 1932.

*Charles Singer, *The Discovery of the Circulation of the Blood*, London, 1922. *De Venarum Ostiolis, 1603*, of . . . . Hieronymus Fabricius of Aquapendente (Facsimile, with translation and notes by H. J. Franklin), Baltimore, 1933. *William Harvey, *Exercitatio anatomica de motu cordis et sanguinis in animalibus, 1628:* an English translation by Chauncey Leake, Baltimore, 1931. William Harvey, Exercitatio anatomica de motu cordis et sanguinis in animalibus, 1628: Facsimile and translation by Chauncey Leake. Baltimore, 1928.

Sir Michael Foster, *Lectures on the History of Physiology during the 17th and 18th Centuries*, Cambridge University Press, 1901. *John F. Fulton, *Physiology*, New York, 1931 (Clio Medica). *John F. Fulton, *Selected Readings in the History of Physiology*, Baltimore, 1930.

*John D. Comrie, *Selected Works of Thomas Sydenham*, London, 1922. Joseph Frank Payne, *Thomas Sydenham*, London, 1900. *David Riesman, *Thomas Sydenham, Clinician*, New York, 1926.

9. MEDICINE IN THE 18TH CENTURY

Hermann Boerhaave (1668–1738), in Leyden, "communis Europae magister," influence of his bedside teaching. His pupils:

Albrecht von Haller (1708–1777) and the University of Göttingen (first modern university established as a center of research). Progress in physiology, Primae Lineae Physiologiae, 1747, (Sensibility and Irritability, 1753).

The school of Vienna (van Swieten, 1700–1772, and De Haen, 1704–1776). Publication of the annual reports of the hospital (case histories and autopsy reports). Leopold Auenbrugger (1722–1809) and the invention of percussion (1761).

The school of Edinburgh (the Monros, John Rutherford, William Cullen, and John Brown's theory (1780).

The foundation of an anatomical pathology. Giovanni Battista Morgagni (1628–1771), De Sedibus et Causis Morborum per Anatomen Indagatis (1761). John Hunter (1728–1793) and general pathology.

The hygienic movement. Health regulations of an authoritative state (Johann Peter Frank, 1745–1821). Philosophical trends leading to enlightenment of the people in matters of health and disease (Jean-Jacques Rousseau).

Immunization against small-pox, variolation and vaccination (Edward Jenner, 1798).

LITERATURE. Stephen D'Irsay, *Albrecht von Haller, Eine Studie zur Geistesgeschichte der Aufklärung*, Leipzig, 1930. *Max Neuburger, *Leopold Auenbruggers Inventum Novum*, a facsimile of the first edition, with German, English and French translations, Vienna and Leipzig, 1922. John D. Comrie, *History of Scottish Medicine*, London, 1932 (Wellcome Historical Medical Museum) 2 vols. Giovanni Battista Morgagni, *De Sedibus et Causis Morborum*, 2 vols, Venetiis, 1761. Giovanni Battista Morgagni, *The Seats and Causes of Disease*, translated by B. Alexander, 3 vols., London, 1769. *Stephen Paget, *John Hunter, Man of Science and Surgeon*, London, 1897. *Esmond Long, *History of Pathology*, 1928. *Esmond Long, *Selected Readings in Pathology, from Hippocrates to Virchow*, Baltimore, 1929. Ernest Caulfield, *The Infant Welfare Movement in the 18th Century*, New York, 1931. Arnold C. Klebs, *Die Variolation im 18ten Jahrhundert*, Giessen, 1914. Charles Creighton, *Jenner and Vaccination*, London, 1889. *Edward Jenner, *An Inquiry into the Causes and Effects of the Variolae Vaccinae* . . . . Facsimile of 1798 edition, Milan, 1923.

10. MEDICINE IN THE 19TH CENTURY

I. General development

Nationalism in medicine, teaching and literature in the vernacular languages.

The French Revolution, reorganization of the medical institutions in France. Paris center of medicine in the beginning of the century. Xavier Bichat (1771–1802, pathology of the tissues). Corvisart (1755–1821, reintroduction of percussion, heart diseases). Laennec (1781–1826, invention of auscultation, 1819, diseases of the lungs). Louis (1787–1872, statistical methods). Claude Bernard (1813–1878, physiology of digestion).

The second Viennese school. The pathologist Rokitansky (1804–1878), the clinician Skoda (1805–1881). The specialties in Vienna.

The German school. The anatomist, physiologist and pathologist, Johannes Müller (1801–1858) Rudolf Virchow (1821–1902, cellular pathology, 1858). Growing importance of the laboratory.

The germ theory of disease. The work of Louis Pasteur (1822–1895), and Robert Koch (1843–1910).

Date of discovery of some of the most important pathogenic micro-organisms.

1873	relapsing fever (Obermeier)
1879	gonorrhoea (Neisser)
1880	typhoid (Eberth and Gaffky)
	leprosy (Hensen)
	malaria (Laveran)
1882	tuberculosis (Koch)
	glanders (Löffler)
	actinomycosis (Bollinger and Harz)
1883	erysipelas (Fehleisen)
	cholera (Koch)
1884	diphtheria (Klebs and Löffler)
	tetanus (Nikolaier)
	pneumonia (Fraenkel)
1887	epidemic meningitis (Weichselbaum)
1894	plague (Kitasato and Yersin)
1897	dysentery (Shiga and Kruse)
1901	sleeping sickness (Forde, Dutton, Brace)
1905	syphilis (Schaudinn)

Filterable virus. Immunization, active (Pasteur); passive (Behring).

Surgery. Anaesthesia, Nitrous oxide (Horace Wells, 1844), ether (Long, 1842, Morton, 1846), chloroform (Flourens, Simpson, 1847). Local anaesthesia (cocaine, Koller, 1884). Antisepsis, Joseph Lister

(1867). Asepsis, (forerunner: Semmelweis, puerperal fever, 1847). Rise of modern surgery. Roentgenology (1895).

The public health movement (Public Healts Act, 1848).

LITERATURE. *Knud Faber, *Nosography*, 2nd edition, New York, 1930. *René-Théophile-Hyacinthe Laennec, *Translation of selected passages from De l'Auscultation Médiate*, with biography by Sir William Hale-While, New York, 1923. *Gerald Bertram Webb, *René-Théophile-Hyacinthe Laennec, a Memoir*, New York, 1928. *Claude Bernard, *Introduction à l'étude de la médecine experiméntale*, Paris (first edition 1865, last edition 1934). Max Neuburger, *Das alte medizinische Wien in zeitgenössischen Schilderungen*, Vienna, 1921. Max Neuburger, *Die Wiener medizinische Schule in Vormärz*, Vienna, 1921. William Haberling, *Johannes Müller, das Leben des rheinischen Naturforschers*, Leipzig, 1924. Walter Pagel, *Rudolf Virchow*, Jena, 1932.

*René Vallery-Radot, *The Life of Pasteur*, translated by Mrs. R. L. Devonshire, New York, 1923. *Bruno Heymann, *Robert Koch*, Leipzig, 1932. *Paul de Kruif, *Microbe Hunters*, New York, 1930.

**The Semi-Centennial of Anaesthesia*, Boston, 1897. *Rickman John Godlee, *Six Papers by Lord Lister* . . . . London, 1921. G. T. Wrench, *Lord Lister, His Life and Work*, London, 1913. *W. Watson Cheyne, *Lister, and His Achievement*, New York, 1925.

Sir M. Morris, *The Story of British Public Health*, London, 1919. *Sir Arthur Newsholme, *The Evolution of Preventive Medicine*, Baltimore, 1927.

11. MEDICINE IN THE 19TH CENTURY

II. The Specialties

A brief review of the essential features in the development of:

1. The basic sciences

Anatomy (Improvement of the technique. Histology. Cytology. Embryology). Physiology (Physical methods. Biochemistry). Pathology (Application of experimental and chemical methods). Pharmacology (From empiricism to experimental pharmacology).

2. Psychiatry

From magical to biological conceptions. Improvements in the hospitalization of the mentally sick (Pinel). Hypnotism, suggestion, psychotherapy.

3. The medical specialties

Pediatrics. Dermatology. Neurology.

4. The surgical specialties

Orthopedics. Gynecology. Obstetrics. Ophthalmology (Helmholtz, ophthalmoscope, 1851). Laryngology (Czermak, laryngoscope, 1858), Rhinology, Otology. Dentistry.

5. The physician's profession

A craftsman in Greece, a cleric in the Middle Ages, a "doctor" from the establishment of the universities on. Court physicians and body physicians. Hospital work. Trends towards socialization (German social insurance, 1883). Medicine in Soviet Russia.

LITERATURE. In order to understand the development of the specialties one ought to read some of the most important original publications in the field. They, as well as the histories of the specialties, are listed in *A Revised Student's Checklist of Texts Illustrating the History of Medicine*, by Fielding H. Garrison, published in this Bulletin (Vol. I, 1933, pp. 333–434), so that references here would be a mere repetition.

12. THE RISE OF AMERICAN MEDICINE

The colonial period. Medical conditions in Virginia. Clerical medicine in New England (Samuel Fuller), the governors (John Winthrop, Jr.). First medical print (Thomas Thacher, 1677). Inoculation of smallpox (Zabdiel Boylston, 1721). Boston Medical Society, 1735. Pennsylvania Hospital, 1752. Medical education (apprenticeships). First medical school (Philadelphia, 1765, John Morgan). Epidemics. Medical legislation.

Expansion to the West. Medical pioneers. Ephraim McDowell (1771–1830, ovariotomy), Daniel Drake (1785–1852, new medical schools, diseases of the Mississippi valley), William Beaumont (1785–1853, gastric juice, 1883).

Scientific development after the Civil War. John Billings (1838–1903, Surgeon-General's Library). Johns Hopkins Hospital (1889) and School of Medicine (1894). William Osler (1849–1919). Rockefeller Institute for Medical Research (1901).

Development of medical education, laboratories, hospitals, nursing, and work in sanitation (Walter Reed and Yellow Fever, 1900). General trends.

LITERATURE. *Francis R. Packard, *History of Medicine in the United States*, New York, 1931, 2 vols. James G. Mumford, *A Narrative of Medicine in America*,

Philadelphia, 1903. *Henry E. Sigerist, *Amerika und die Medizin*, Leipzig, 1933 (English edition in preparation: *American Medicine*, New York, W. W. Norton, 1934). *Henry R. Viets, *A Brief History of Medicine in Massachusetts*, Boston and New York, 1930. Wyndham Blanton, *Medicine in Virginia in the 17th Century*, Richmond, 1930. Wyndham Blanton, *Medicine in Virginia in the 18th Century*, Richmond, 1931.

August Schachner, *Ephraim McDowell, Father of Ovariotomy* . . . . New York, 1890. Otto Juettner, *Daniel Drake and his Followers*, Cincinnati, 1909. *William Beaumont, *Experiments and Observations on the Gastric Juice and the Physiology of Digestion* (Reprinted, Boston, 1929, with Osler's Essay on Beaumont). *John T. Morse, *Life and Letters of Oliver Wendell Holmes*, Boston and New York, 2 vols., 1896. *Harvey Cushing, *Life of Sir William Osler*, New York, 1925, 2 vols. *Edith G. Reid, *The Great Physician, A short Life of Sir William Osler*, New York, 1931.

1000 reprints of this syllabus have been made, and are available for sale at the Institute at $.10 a copy.

ACTIVITIES OF THE INSTITUTE OF THE HISTORY OF MEDICINE

On Saturday, February 10, 1934, the Osler Club, an organization of pre-medical students at St. John's College of Annapolis, and the Biology Club of the Annapolis High School, visited the Institute. Dr. Sigerist delivered an address on the development of the Johns Hopkins School of Medicine, and on the Institute of the History of Medicine. An exhibit illustrating the different types of ancient medical books (manuscripts, incunables, etc.) had been arranged in the Seminar Room, and a lunch was given to the visitors.

On February 15, a regular meeting of the Johns Hopkins Medical History Club was held in the Hurd Memorial Amphitheatre. Dr. Arnold C. Klebs, of Nyon, Switzerland, delivered an address on "The Making of an Editio Princeps." He gave the history of the printing of Michele Savonarola's "Practica" (Colle, 1479), a copy of which could be demonstrated through the generosity of the Library of Congress. Dr. Klebs' paper will be published in a later issue of this Bulletin. Then a film, showing the discovery of anaesthesia, made and loaned by the Mallinckrodt Chemical Works, was shown.

On February 22, the Johns Hopkins Medical and Surgical Associations held a meeting at the Institute. Dr. Sigerist discussed the research and educational work of the department, Dr. Garrison spoke on medical libraries and medical bibliographies, and Dr. Temkin spoke on research in Hippocratic medicine.

Reprints of Volume II of the Bulletin (Subscription, $5.00) may be had by writing to the Institute.

H. E. S.